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## DISEASES CAUSED BY BACTERIA AND FUNGI

Reid, W. B. & Wilson, J. B. (1959). **A study of the staphylococci associated with the bovine udder.**—Amer. J. vet. Res. 20, 825-831. 1285

69 coagulase-positive strains and 1 coagulase-negative strain were examined for biochemical activity, pigment and toxin production, antibiotic sensitivity, vitamin requirements and bacteriophage sensitivity. Strains from acute mastitis, chronic mastitis and normal udders were compared. In most of their properties, these three groups showed only small differences although strains from acute mastitis had rather greater biochemical activity and were more often pigmented. The greatest difference was in their ability to produce opacity in egg-yolk broth. 73.3% of strains from acute mastitis had this property but only 6.9% of those from chronic mastitis and 7.7% of those from normal udders.

—IAN DAVIDSON.

Coles, E. H. & Eisenstark, A. (1959). **Staphylococcal phages. I. Lysogenicity in Staphylococcus aureus of animal origin. II. The use of human typing phages and adapted human typing phages in the typing of Staphylococcus aureus of animal origin. III. Typing of Staphylococcus aureus cultures isolated from the bovine udder.**—Amer. J. vet. Res. 20, 832-834; 835-837 & 838-840. 1286

An account of work reported earlier in a dissertation and already abstracted [see *V.B.* 29, 2314].—IAN DAVIDSON.

Jones, L. P. (1959). **Purulent panophthalmitis in laboratory rats.**—J. Amer. vet. med. Ass. 135, 502-503. [Author's summary modified.] 1287

A strain of *Staphylococcus* was isolated from rats with acute purulent panophthalmitis. Infection involved the older, more mature animals and was confined to the eye. Rats

were effectively treated with chlortetracycline (both oral and local application) and recovery was hastened by 2 mg. prednisolone i/m.

Lindorfer, R. K. & Subramanyam, P. (1959). **Induced immunological unresponsiveness to staphylococcus toxoid in rabbits.**—Proc. Soc. exp. Biol., N.Y. 102, 168-170. [Authors' summary modified.] 1288

Rabbits exposed to staphylococcal toxoid early in life have a reduced capacity to respond to the toxoid in later life. Resistance to the dermonecrotic effects of staphylococcal toxin is also reduced. The role of acquired tolerance and similar phenomena in infectious diseases is also discussed.

Murray, R. G. E., Francombe, W. H. & Mayall, B. H. (1959). **The effect of penicillin on the structure of staphylococcal cell walls.**—Canad. J. Microbiol. 5, 641-648. [Authors' abst. modified.] 1289

Cultures of sensitive strains of *Staph. aureus* were fixed with osmium tetroxide after 1-5 hours' exposure to various doses of penicillin and were embedded in methacrylate for sectioning and electron microscopy.

The cells increased in size and the surrounding cell wall was thinner than normal. The main lesions appeared in the developing cell wall septa, which showed a loss in density and gross irregularity of shape.

Two resistant strains were exposed to penicillin. In one, the cells showed no morphological effects; in the other, there was temporary damage to the cell septa with complete recovery.

The observations support the hypothesis that penicillin interferes with the synthesis of a cell wall component and indicate that the main point of cell wall synthesis is at the site of septum formation.



Kretzschmar, C. (1959). Über den kulturellen Nachweis von Galtstreptokokken aus Einzel- und Sammelmilchen unter Ausnutzung des Camp-Phänomens. [**Cultural demonstration of mastitis streptococci in milk samples by making use of the CAMP phenomenon.**]—Arch. exp. VetMed. 13, 678-684. 1290

Mastitis was diagnosed by direct streaking of milk sediment onto CAMP plates. It was claimed that this method overcame disadvantages of selective media.—R.M.

Hyde, J. L. & Murphy, J. M. (1959). **The effects of the local application of a hyperkeratotic chemical on morphology of the bovine teat canal and susceptibility to swab exposures with Streptococcus agalactiae.**—Cornell Vet. 49, 443-459. 1291

This work has been previously abstracted from Hyde's thesis [*V.B.* 30, 324].—R.M.

Kuwert, E., Becker, C.-H. & Köhler, W. (1959). Streptokokkeninfektionen bei Nerzen. (Ein differential-diagnostischer Beitrag zur Nerzstaube). [**Streptococcal infections in mink and differential diagnosis from distemper.**]—Mh. VetMed. 14, 528-532. 1292

A disease with nervous and catarrhal symptoms, fatal after 2-3 days' illness, caused losses of 230 young mink during a month on a farm of 3,500 mink. Complement-fixation tests for distemper and rabies were negative. Beta-haemolytic streptococci were isolated in pure culture from all the organs and the disease was reproduced in mink by s/c inj. of 1 ml. of broth culture. The organisms belonged to Lancefield Group C. Hygienic improvements prevented further losses.

—R.M.

Stollerman, G. H., Siegel, A. C. & Johnson, E. E. (1959). **Evaluation of the "long chain reaction" as a means for detecting type-specific antibody to Group A streptococci in human sera.**—J. exp. Med. 110, 887-897. [Authors' summary modified.] 1293

Certain strains of Group A streptococci showed striking increase in chain length when grown in liquid media to which were added human sera that contained antibody to M protein of homologous type. (M protein is a type-specific antigen of Group A streptococci.) This reaction was a highly specific and sensitive test for specific antibody of human type.

Ritchie, J. N. (1959). **Bovine tuberculosis: the end in sight.**—Roy. Soc. Hlth J. 79, 461-467. Discussion: pp. 467-469. 1294

Bovine TB. is reviewed from the

veterinary and public health aspects and its general incidence in Europe outlined. In Great Britain the disease followed in the wake of the Industrial Revolution and in 1847 it affected 20% of 4,000 Durham cattle; towards the end of the century the majority of cattle in town dairies were "more or less phthisical". The peak incidence was reached about the beginning of the present century and in 1946 it was estimated that of all cattle 20% in England, 7.5% in Wales and 14% in Scotland (with 30-35% of cows) were infected. Susceptibility, predisposing, contributory and precipitating causes, and control measures are discussed. Facts and figures are given in support of the Tuberculosis Order, 1925, the eradication scheme is concisely presented, the benefits accruing from it are briefly enumerated and risks of re-infection in attested herds are discussed. Successful results achieved are recorded and it is considered that "by the end of 1960 bovine TB. will have been virtually eradicated from the national herd in the sense that all herds will have reached the present attested standard of freedom from infection."—T.E.G.R.

Kerruish, D. W. (1959). **Eradication of bovine tuberculosis in the Isle of Man.**—Agriculture, Lond. 66, 301-303. 1295

A scheme, at first voluntary, later compulsory, for the eradication of bovine TB. in the Isle of Man started in 1949. Full market value was paid for slaughtered reactors, and bonuses were paid for attested herds. In initial tests the incidence of reactors was 26%. The island is now free from bovine TB. A hospital ward used solely for treating children infected with the bovine type tubercle bacillus is no longer used for this purpose and the island is now self-supporting in beef.—M.G.G.

Kutleša, I., Marić, I. & Mikić, F. (1959). Die Verlässlichkeit der sogenannten intrakutanen Ergänzungsproben bei der allergischen Diagnostik der Rindertuberkulose. [**Reliability of a supplementary tuberculin test after doubtful tuberculin reactions in cattle.**]—Rindertuberk. u. Brucellose 8, 97-114. 1296

Results of supplementary tuberculin tests using either mammalian or avian tuberculin, in 37 tuberculous cattle and 22 doubtful reactors, appeared to confirm the findings of Plum [*V.B.* 25, 3508] that there is desensitization to tuberculin as early as 72 hours after the main i/d test.—E.G.



Spitznagel, J. K. & Sharp, D. G. (1959). **Magnesium and sulfate ions as determinants in the growth and reproduction of *Mycobacterium bovis*.**—J. Bact. 78, 453-462. [Authors' summary modified.] 1297

Bovine type tubercle bacilli required Mg and sulphate for normal growth and multiplication. Mg deficiency did not prevent cell wall synthesis but branching occurred and the number of chromatin bodies increased. Sulphate deficiency permitted the synthesis of cell wall and protoplasm.

Darzens, E. (1959). **Desoxyribonucleic acid as growth stimulant of tubercle bacilli.**—Amer. Rev. respir. Dis. 80, 866-870. [Summaries in French and Spanish. Author's summary modified.] 1298

Desoxyribonucleic acid (DNA) was obtained from living pathogenic tubercle bacilli. This substance was alcohol-acid fast. The explosive growth-promoting action of DNA was observed in old, degenerating cultures of BCG and tubercle bacilli kept for three months in a refrigerator.

DNA isolated from *M. phlei* had a feeble growth-promoting effect on BCG cultures.

Szabó, I. & Kertay, N. (1959). **Neue Angaben über die Verbreitung der extrapulmonalen menschlichen Tuberkulose vom Bovin-Typus in Ungarn. [Extrapulmonary tuberculosis caused by the bovine type of bacillus in Hungary.]**—Acta microbiol. Acad. Sci. hung. 6, 157-159. [In German.] 1299

Of 248 strains isolated from human beings, 35% were of bovine type. They were present in one-third of cases of urino-genital TB.—R.M.

Paraf, J., Desbordes, J., Fournier, É. & Blomet, J. (1959). **Contribution à l'étude de l'extraction de la tuberculine des cellules d'une mycobactérie pathogène (souche H37Rv). [Rapid extraction of tuberculin from a pathogenic strain of tubercle bacillus.]**—Rev. Immunol. 23, 312-322. 1300

Tuberculin was extracted in less than 24 hours from washed cultures of tubercle bacilli at 37°C. at pH 7 by exposure to a solution of sodium citrate (3 g. per 100 ml.). Similar results were achieved with solutions of many other sodium salts, but alcohol and salts of mercury, chromium, silver and zinc failed to extract tuberculin.—M.G.G.

Lesslie, I. W., Ford, E. J. H. & Linzell, J. L. (1960). **Tuberculosis in goats caused by the**

**avian type tubercle bacillus.**—Vet. Rec. 72, 25-27. [Authors' summary modified.] 1301

An outbreak of TB. in a herd of goats, caused by the avian type tubercle bacillus, is described. The organism was recovered from 3 goats on P.M. examination and was typed by culture and biological tests. One of the 3 goats was not tuberculin tested but 10 out of 85 animals gave avian reactions to the tuberculin test. The origin of the infection is thought to have been wild birds.

Patterson, D. S. P. (1960). **Influence of cobalt and zinc ions on the growth and porphyrin production of *Mycobacterium tuberculosis avium*.**—Nature, Lond. 185, 57. 1302

Dorset's medium and the same medium containing the complete trace element supplement described by Paterson *et al.* [*V.B.* 29, 616] were used for the growth of *M. tuberculosis avium*. Flasks were also prepared containing single supplements—0.27 p.p.m. cobalt, 1.07 p.p.m. copper or 6.04 p.p.m. zinc. After incubation for 45 days the complete supplement stimulated growth threefold and porphyrin production (which was maximal after 45 days) was increased about 62 times. With the same amount of zinc or cobalt separately, growth stimulation and porphyrin production were about half as much as when the full supplement was used. Copper alone had no effect. The stimulating effect of the complete supplement is considered to be largely, if not solely, due to zinc and cobalt.

—T.E.G.R.

Munday, B. L. (1959). **Skin sensitivity to tuberculins in cattle vaccinated against Johne's disease.**—N. Z. vet. J. 7, 129-133. [Author's summary.] 1303

Tuberculin testing of animals vaccinated against Johne's disease revealed a high proportion of reactors to the mammalian caudal fold test and the avian and mammalian single intradermal neck tests. The Stormont test gave a much lower incidence of positive reactors.

The possible significance of these results is discussed.

A direct correlation between the intensity of the tuberculin reactions and the physical condition of the vaccinated animals was noted.

Durr, F. E., Smith, D. W. & Altman, D. P. (1959). **A comparison of the virulence of various known and atypical mycobacteria for chickens, guinea pigs, hamsters, and mice.**—



Amer. Rev. respir. Dis. **80**, 876-885. [Summaries in French and Spanish.] 1304

The authors compared avian and atypical mycobacteria, using the chicken as host.

The photochromogens regularly caused progressive disease in hamsters and mice, although none died. Non-photochromogens were much less virulent for the test animals than were the photochromogens; neither caused specific lesions in fowls.

The results suggest that if atypical mycobacteria and especially non-photochromogens are related to avian mycobacteria they are most certainly very attenuated avian strains.—R.M.

Szemerédi, G. & Temesi, Z. (1959). *Corynebacterium* okozta vetélés juhállományokban. [**Corynebacterial abortion in sheep.**]—Mag. állator. Lapja **14**, 276-279. [In Hungarian. Summaries in English and Russian.] 1305

In 8 flocks where sporadic abortions, with an incidence of 3-11%, occurred in the second and last thirds of pregnancy mainly in first lambing ewes, P.M. and bacteriological examinations were made on some of the aborted foetuses. In 3 flocks from all, and in 5 flocks from some of the examined foetuses a corynebacterium was isolated (total 30 strains), which morphologically, culturally, biochemically and in its pathogenic behaviour closely resembled *C. ovis*. The P.M. findings which, in 60% of the cases were mainly necrotic foci in the liver, are described in detail.—A. SEBESTENY.

Rižnar, S. & Hajsig, M. (1959). O značenju *Corynebacterium pyogenes* u patologiji puerperija i steriliteta govoda s posebnim osvrtom na infekcije ljudi. [**Role of Corynebact. pyogenes in bovine sterility and puerperal diseases, with reference to infection in veterinarians.**]—Vet. Arhiv **29**, 173-180. [In Croat. Summaries in English and German.] 1306

Genital organs and uterine secretions of 221 cows and heifers with various puerperal disorders, such as abortion, sterility or chronic purulent endometritis, were examined. *Corynebact. pyogenes* was isolated from 8 of 38 animals with chronic purulent endometritis and from 20 of 49 with other puerperal disorders. Among other organisms isolated were *Escherichia coli*, streptococci of the viridans and  $\beta$ -haemolytic groups, *Proteus vulgaris*, etc. *C. pyogenes* was also isolated from the ejaculate of a bull from an A.I. centre, and in pure culture or together with

staphylococci from ulcers on the forearms of two veterinarians who had treated calving cows.—E.G.

Shuman, R. D. (1959). **Comparative experimental evaluation of swine erysipelas bacterins and vaccines in weanling pigs, with particular reference to the status of their dams.**—Amer. J. vet. Res. **20**, 1002-1009. [Abst. from author's summary.] 1307

Three vaccines (adsorbate after Traub, 1947; lysate after Delpy & Hars, 1953; living attenuated after Gray & Norden, 1955, with or without immune serum) were used in trials on weaned pigs from 9 litters born to vaccinated and unvaccinated sows of known immune or susceptible status. Each litter was represented in each test, control and contact-control group. All the pigs were challenged by skin scarification after 96 days. Except for 2 of the pigs that had been given adsorbed vaccine, all (including both types of controls) were susceptible, though degree of susceptibility between vaccinated groups varied according to type of vaccine given and status of the dam. Essential points emerging were as follows.

Pigs given adsorbed vaccine appeared to be similar in susceptibility regardless of the status of their dams. With lysate vaccines, pigs from (vaccinated and non-vaccinated) immune dams were less susceptible than pigs from non-vaccinated susceptible dams. With attenuated vaccine without serum, pigs from vaccinated immune dams were less susceptible than pigs from non-vaccinated (susceptible or immune) dams; differences in response when serum was given were not considered significant.

Pigs given adsorbed, lysate, or the attenuated vaccine were similar in susceptibility only when they were derived from vaccinated immune dams.

The non-vaccinated control pigs from vaccinated and from non-vaccinated immune dams were similar in susceptibility, but were less susceptible than those from non-vaccinated susceptible dams.

Trbić, B. & Tadić, Ž. (1959). Erysipelotrix rhusiopathiae kao uzročnik oboljenja fazana. [**Erysipelothrix rhusiopathiae infection in pheasants.**]—Vet. Glasn. **13**, 642-643. [In Croat. Summary in German.] 1308

On a pheasant farm, *E. rhusiopathiae* was demonstrated in birds which had died from an acute septicaemic disease. P.M. there was enlargement of the spleen and ureters, conges-



tion of the liver and in some, enteritis. Mortality was high, especially among younger birds.—E.G.

Jentzsch, K.-D. (1959). Reduktionsproben zur Unterscheidung von Rotlaufbakterien und Listerien. [Reduction tests for the differentiation of *Erysipelothrix rhusiopathiae* and *E. monocytogenes*.] — Arch. exp. VetMed. 13, 685-690. 1309

J. criticized reduction tests described by Plashke [V.B. 29, 2346] and Kujumgiev [V.B. 29, 3045]. In the author's experience methylene blue and litmus solution were decolorized within 1-4 hours by *E. monocytogenes* and were not decolorized by *E. rhusiopathiae*, but neither organism decolorized neutral red. However, these tests were not sufficiently specific or reliable, and established methods were just as quick and more certain.—R.M.

Osebold, J. W., Njoku-Obi, A. & Abare, J. M. (1959). Acquired resistance of sheep to *Listeria monocytogenes* and pilot studies on vaccination. — Amer. J. vet. Res. 20, 966-972. 1310

Of 13 sheep inoculated s/c with live virulent *Erysipelothrix (Listeria) monocytogenes*, 12 did not develop encephalitis after intracarotid challenge with the same strain 1-27 months later, but 2 died from endocarditis. Fatal encephalitis developed in one challenged after 27 months. Of 8 sheep immunized s/c with killed or with live avirulent organisms, 6 died from encephalitis when challenged a month later. Good antibody titres were observed in the sheep immunized with live virulent organisms, but not in the remainder. The organism was not recovered from the tissues of 6 sheep that survived challenge.—M.G.G.

Sterne, M. (1959). The continuous culture of *Pasteurella multocida*. FAO meeting on the control of haemorrhagic septicaemia. pp. 5. Rome: Food and Agriculture Organization. [Working paper No. 4.] 1311

Sterne's apparatus [see also V.B. 28, 3108] for continuous cultivation differs chiefly from that of Bain [see V.B. 28, 3494] in that it uses sparger instead of vortex aeration. This dispenses with the need for electrical equipment. Contamination is not a problem provided that apparatus and materials are sterilized correctly and that the air filter described is used.—M.G.G.

Iyer, S. V. & Rao, D. V. R. (1959). Studies on haemorrhagic septicaemia adjuvant vaccines. II.—Indian vet. J. 36, 415-426. 1312

The formalized 24-hour growth in nutrient broth of virulent "*Pasteurella bovisepitica*" was used for preparing (1) an oil-adjuvant vaccine and (2) an alum-precipitated vaccine. All the 16 calves were immune to challenge between 188 and 387 days after vaccination with the former, but only 16 of 24 survived challenge between 150 and 187 days after vaccination with the latter. Of the 18 controls used in the challenge tests, 5 survived.—R. N. MOHAN.

Lee, M. L. H. & Buhr, A. J. (1960). Dog-bites and local infection with *Pasteurella septica*. — Brit. med. J. January 16th, 169-171. [Authors' summary modified.] 1313

Of 69 cases of dog-bite investigated bacteriologically 20 developed frank wound infection. *Past. septica*, an organism sensitive to penicillin in normal therapeutic doses, was cultured from 12 wounds. Ten of these became infected. Only five other local infections with *Past. septica* following dog-bites have been reported in Gt. Britain. Routine bacteriological examination of these bites might show that this type of infection is fairly common. Infected bites need prolonged treatment and leave unsightly scars. Evidence suggests that prophylactic penicillin therapy should be given to all patients with serious dog-bites and particularly to those whose bites have been sutured.

Weidenmüller, H. (1959). Zur Rodentiose bei Tier und Mensch. [*Pasteurella pseudotuberculosis* infection in animals and man.]—Tierärztl. Umsch. 14, 256-259. 1314

At the Bavarian institute for animal disease control *Past. pseudotuberculosis* was isolated from 58 of 342 hares submitted for examination over a period of 5 years. 32 of the strains belonged to serological group I, and 19 to group II. The organism was found in faeces from 5 of 30 g.pigs and 10 of 30 field mice and house mice. Mice were regarded as the chief carriers of infection.—R.M.

Heddleston, K. L. & Reisinger, R. C. (1959). Studies on pasteurellosis. III. Control of experimental fowl cholera in chickens and turkeys with an emulsified killed vaccine.—Avian Diseases 3, 397-404. [Authors' summary modified.] 1315

To determine the lowest concentration of a suspension of formalin-killed *Pasteurella*



*septica* that would produce immunity in chickens, 4 groups of chickens were inoculated with vaccine of different bacterial concentrations, and exposed, with controls, to virulent *Past. septica* 26, 36, and 54 weeks later. One group of turkeys was injected with one of the vaccines and their immunity was challenged 21 weeks after vaccination.

There was no significant difference in the ability of the vaccines of different concentration to establish a high degree of immunity in chickens for at least one year. Eighteen of 19 turkeys survived the challenge, whereas only 1 of 11 controls survived.

Criteria for selection of strains of *Past. septica* suitable for making vaccines and a method for production of the vaccines are presented.

Gamčík, P. (1959). Význam vyšetřování býků na přítomnost pseudomonas aeruginosa v prepúciu a v semene. [*Pseudomonas pyocyanea* in prepuce and semen of bulls.].—*Veterinářství* 9, 211-214. [In Slovak.] 1316

*Ps. pyocyanea* was isolated from semen samples of 9 of 11 bulls at an insemination centre. In cows inseminated from these bulls there were disturbances in the oestrous cycle. By adding a mixture of streptomycin, penicillin and polymyxin, semen became practically free from *Ps. pyocyanea* within 24 hours. Infected bulls were given preputial washes with 0.25-0.5% soln. of polymyxin.—E.G.

Harvey, D. G. & Carne, P. (1960). Studies on some chemical aspects of the pathological activities of strains of *Escherichia coli* of bovine origin.—*J. comp. Path.* 70, 84-108. [Authors' conclusions modified.] 1317

Relatively simple analytical techniques failed to reveal in 12 strains of bovine *E. coli* any significant differences, or any specifically toxic product other than a lipopolysaccharide. This was present in virulent and non-virulent strains in concentrations that did not appear to bear any relation to virulence. From acute toxicity experiments on small animals, and a few on the isolated small intestine of rabbits there were no definite indications that could explain the mechanism of scouring. It was clear that this property of virulent strains of *E. coli* was intimately associated with the viability of the organism, rather than directly with the presence of a toxic lipopolysaccharide. Similar findings and conclusions would probably have resulted from a survey of a much wider range of bovine coliform organisms. More detailed studies of the

essential structural materials, particularly the nucleic acids, of the bacterial cell were indicated.

Smith, H. Williams & Crabb, W. E. (1960). The effect of chemotherapy on the numbers of *Bacterium coli* in the faeces of calves.—*J. comp. Path.* 70, 126-134. [Authors' conclusions modified.] 1318

The authors studied the comparative effect of different antibiotics and sulphonamides, together with the influence of dose, frequency and route of administration, on the viable count of *Escherichia coli* in the faeces of healthy calves. The numerical aspect of the emergence of resistant strains was also investigated.

Roberts, H. E. & Vallely, T. F. (1959). An investigation into the relationship of haemolytic *Escherichia coli* to disease in pigs.—*Vet. Rec.* 71, 846-850. [Authors' summary modified.] 1319

Cultural examination of pigs during routine post-mortem service revealed that haemolytic *E. coli* was a not uncommon inhabitant of the intestines of pigs of all ages. A high concentration of these organisms, usually found throughout the intestines, could be specifically correlated with a (gastro) enteritis, hitherto undesigned, and occurring chiefly in store pigs. The haemolytic *E. coli* in such cases belonged in the main to 5 serotypes, whereas strains isolated from the intestines in other diseases showed much greater serological variety. Clinical and epidemiological data implicated a disease syndrome resembling bowel oedema in many ways, but with oedema as an uncommon post-mortem feature. Favourable reports of antibiotic treatment supported the suggested aetiological connexion with haemolytic *E. coli*. An analysis of enteric conditions encountered in routine diagnosis confirmed the importance of haemolytic *E. coli* infection in store pig mortality, but indicated that "baby piglet enteritis" is more typically associated with non-haemolytic *E. coli*.

Campbell, S. G. (1959). Studies on strains of haemolytic *Escherichia coli* isolated from normal swine after weaning.—*Vet. Rec.* 71, 909-911. [Author's summary modified.] 1320

In rectal swabs from 293 normal pigs, 127 strains of haemolytic *E. coli* were isolated.

The distribution of serotypes in normal pigs is discussed. The serotypes concerned are those commonly found in association with oedema disease in Canada. Of the 293 pigs



samples, 55 were found to possess one of these specific serotypes as part of their bacterial flora.

Gross, W. B. & Siegel, P. B. (1959). **Coliform peritonitis of chickens.**—*Avian Diseases* 3, 370-373. [Authors' summary.] 1321

Peritonitis was produced in chickens by inoculating sterile yolk intraperitoneally and at the same time a pathogenic strain of *Escherichia coli* intraperitoneally or into the vagina. It was suggested that peritonitis naturally occurs when the peritoneal cavity is contaminated with yolk and *E. coli* enters through the vagina.

Yaphe, W. (1959). **Effect of acid hydrolyzates of agar on the growth of *Escherichia coli*.**—*Canad. J. Microbiol.* 5, 589-593. [Author's abstr. modified.] 1322

The inhibitory effect of the products of acid hydrolysis of agar was associated with the degree of hydrolysis. Inhibition was obtained at two very different concentrations. When the hydrolysis was complete, the inhibitory pattern was similar to that of 5-hydroxymethyl-2-furaldehyde. Under conditions of mild acid hydrolysis, the inhibitory effect was caused by a heat-labile degradation product of 3, 6-anhydro-L-galactose.

Panebianco, F. (1959). **Ulteriore contributo allo studio della malattia degli edemi dei suini. [Oedema disease of swine.]**—*Acta med. vet., Napoli* 5, 335-346. [Summaries in English and French.] 1323

The literature is reviewed and personal observations recorded. Haemolytic *Escherichia coli* was isolated from c.n.s. tissue of one pig. Of 8 mice inoculated intracerebrally with broth culture 7 died after 14-15 hours and the other after 27 hours. Of 6 mice inoculated intracerebrally with extract of broth culture one died after 17, one after 40, one after 48 and the rest after 50 hours; four mice inoculated with brain suspension from the one that died after 48 hours were still alive 20 days later.—T.E.G.R.

Larson, C. L., Ribí, E., Milner, K. C. & Lieberman, J. E. (1960). **A method for titrating endotoxic activity in the skin of rabbits.**—*J. exp. Med.* 111, 1-20. [Authors' summary modified.] 1324

The primary inflammatory response of rabbits to intradermal injection of bacterial products has been used as the basis of a sensitive assay for endotoxins. Injection of material into the skin of the lateral surfaces,

rather than the ventral surface of the abdomen, was essential. Statistical examination revealed an excellent correlation between the mean threshold dose for producing skin lesions in rabbits and the median lethal dose for mice. The method was devised for endotoxins prepared in various ways from *Salmonella enteritidis* and *S. typhi* but was directly applicable to endotoxins from several other species of enteric Gram-negative bacteria.

Vasenius, H. (1959). **Kotieläinten salmonelloositilanne Suomessa kesällä 1959. Vel:ssä tutkittujen näytteiden valossa. [Salmonella typhi-murium infection of cattle in Finland in 1959.]**—*Finsk VetTidskr.* 65, 651-653. [In Finnish. English summary modified.] 1325

During July-August 51 cases of *Salmonella typhi-murium* infection in cattle were encountered along the western coast of Finland. Most cases occurred on farms near the rivers. Water was suspected as the source of infection.

Pritulin, P. I. (1959). **[Paratyphoid in sheep and calves resulting from airborne infection.]**—*Veterinariya, Moscow* 36, No. 9 pp. 26-27. [In Russian.] 1326

22 sheep and 9 calves aged 6-42 months were exposed by means of a face mask to aerosols of *S. enteritidis*, *typhi-murium* and *cholerae-suis*. The minimum infective dose was 150-200 million organisms per kg. body wt., 3-4 times lower than the oral infective dose. The lethal dose was 1-1.5 thousand million organisms per kg. body wt., such as was produced by exposure for 1-1.5 hours to air at 10° to 18°C. containing 55-65 million organisms a litre. Organisms were isolated from bronchial and mediastinal lymph nodes 1-2 months after infection.—R.M.

Frik, J. F. (1959). **Enige ervaringen met experimentele Salmonellainfecties bij met kunstmelk gevoerde kalveren en behandeling daarvan met furazolidone (handelsnaam furoxone). [Experimental salmonellosis in calves fed milk substitute and its treatment with furazolidone.]**—*Tijdschr. Diergeneesk.* 84, 1057-1074. [In Dutch. Summaries in English, French and German.] 1327

Acute infection was induced in calves by feeding milk or milk-substitute containing at least 1,000 million organisms of *S. dublin* in one dose. For rapid diagnosis of acute infection, blood culture was the best method. Tests for agglutinins were valuable in chronic



and healed infections. *S. typhi-murium* caused bacteraemia less often than *S. dublin*, and infection was less severe.

Furazolidone given by mouth at 30 mg./kg. body wt. daily for 4 days cured acute infection, but relapse occurred in some calves. When milk-substitute contained 12 µg. chlortetracycline per ml., multiplication of antibiotic-susceptible salmonella was not inhibited and calves fed the milk became infected. Although resistance of salmonella to this antibiotic was relatively rare, *Escherichia coli* soon became resistant.—R.M.

Watson, W. A. (1960). **Salmonella dublin infection in a lambing flock.**—Vet. Rec. 72, 62-64 & 65. [Author's summary modified.] 1328

In the outbreak described 12 of 298 ewes died after giving birth to dead lambs from which *S. dublin* was isolated. Thirty-six ewes aborted or gave birth to stillborn lambs, and 40 lambs born alive died in the first month of life. *S. dublin* was isolated from 46 of 65 lambs examined and from the faeces of two dogs, one wild goose, and a calf. Furazolidone administered to 50 ewes before lambing had no effect on the course of the disease. The possible sources of infection are discussed.

Calaprice, A. (1959). L'aborto ovino da salmonella in Campania. Contributo alla conoscenza della diffusione e dell'importanza rivestita dal maschio riproduttore quale fonte e via di trasmissione naturale dell'infezione. [**Role of the male in the incidence of salmonella abortion in sheep.**]—Acta med. vet., Napoli 5, 277-285. [Summaries in English and French.] 1329

Two of four rams, in whose semen *S. abortus-ovis* was demonstrated, were kept with 8 healthy ewes of which 2 conceived. Of these, one gave birth, at full term, to a non-viable lamb and the other aborted in the fourth month. The agglutinating titres of the 2 ewes were between 1:160 and 1:640 and *S. abortus-ovis* was demonstrated in the lamb and aborted foetus. This is taken to indicate that the male is the main source and active transmitter of infection at coitus.—T.E.G.R.

Battelli, C., Lo Muzio, F. & Pacelli, C. (1959). Il nitrofurazone nel trattamento della salmonellosi suina da *S. cholerae suis* var. kuzendorf. [**Nitrofurazone treatment of swine paratyphoid.**]—Vet. ital. 10, 865-869. [Summaries in English and French.] 1330

Nitrofurazone was administered in the

food (0.02% mixture) for five consecutive days to 89 pigs in herds infected with *S. cholerae-suis*, 43 of which had clinical symptoms and the rest were normal. All except 5 survived.—T.E.G.R.

Watanabe, S., Sawada, A., Kitajima, Z., Ota, K., Kobori, S. & Sakazaki, R. (1959). [**Results in 1957 of salmonella detection from stray dogs in Tokyo prefecture.**]—J. Jap. vet. med. Ass. 12, 485-487. [In Japanese. Summary in English.] 1331

Salmonella was isolated from the mesenteric lymph nodes of 29 of 200 stray dogs in Tokyo:—7 strains of *S. enteritidis*, 6 *S. stanley*, 4 *S. typhi-murium*, 4 *S. narashino*, 3 *S. tananarive* (reported for the first time in Japan), 3 *S. give*, one *S. thompson* and one *S. bredeney*.—M.G.G.

Ellemann, G. (1960). Undersøgelse af høns og kyllinger på et fjerkræslageri med henblik på fund af salmonellabakterier fra kloaken. [**Examination of fowls at a poultry plant for salmonella bacteria in the cloaca.**]—Nord. VetMed. 12, 47-53. [In Danish. Summaries in English and German. English summary modified.] 1332

The author examined faeces from 2,835 poultry, two-thirds of which were adult hens and one-third chicks and roosters.

Only nine samples contained salmonella; four *S. typhi-murium*, three *S. nilose*, one *S. meleagridis* and one *S. kretfeld*. The author concluded that the risk of transmission of salmonella bacteria from infected birds to the poultry ready for sale was very small under the conditions found at the poultry plant.

Clarenburg, A. (1959). De betekenis van Salmonella in voedingsmiddelen voor mens en dier. [**Significance of salmonella in foods for man and animals.**]—Tijdschr. Diergeneesk. 84, 1094-1101. [In Dutch. Summaries in English and German.] 1333

C. discussed the occurrence of salmonella in egg products, animal meals and fish meals in the Netherlands between 1952 and 1958. 4.8% of 2,690 samples of dried or frozen hens' eggs were infected and 20.8% of 401 samples of dried or frozen ducks' eggs. Salmonella organisms were isolated from 10% of 228 samples of imported animal meal and from 3 of 300 samples of imported fish meal.—R.M.

Compagnucci, M. (1959). Ricerche sull'azione di un *S. A. Q.* da solo o associato ad alcune sostanze chimiche, sulla *S. pullorum*. [**Action**



of a quaternary ammonium compound on *Salmonella pullorum*.] — Zooprofilassi 14, 735-753. 1334

Results of tests indicate that alkyl-dimethyl-benzyl-ammonium chloride, alone or in combination with sodium hydrate, has possibilities as an external disinfectant for hen's eggs.—T.E.G.R.

Jeffries, L. (1959). **Novobiocin-tetrathionate broth: a medium of improved selectivity for the isolation of salmonellae from faeces.**—J. clin. Path. 12, 568-571. [Author's summary modified.] 1335

Of the non-lactose-fermenting Gram-negative bacilli encountered in faeces, *Proteus* is the most sensitive and *Salmonella* the most resistant to novobiocin.

Tetrathionate broth containing 40 µg. novobiocin/ml. medium has proved superior to plain tetrathionate broth as an enrichment medium for the isolation of *Salmonella* from faeces artificially infected with known numbers of *Salmonella* and *Proteus*.

Filipovitch, D. (1959). Sur les causes de certaines faiblesses dans la lutte contre la brucellose bovine. [**Certain difficulties in control of bovine brucellosis.**] — Bull. Off. int. Epiz. 51, 650-655. [Summaries in English and Spanish.] 1336

Failure to control brucellosis is due to the following factors: difficulties in diagnosis, particularly in vaccinated animals; annual instead of repeated tests of blood and milk; inability or neglect of owners to segregate reactors; failure to take precautions when abortions occur; lack of compensation and legislation for the slaughter of reactors; use of common pasture and watering-places by cattle from different farms; trade in infected cattle.—M.G.G.

Richardson, M. (1959). **Parasitization in vitro of bovine cells by *Brucella abortus*.**—J. Bact. 78, 769-777. [Author's summary modified.] 1337

Normal bovine fixed-tissue cells have been routinely grown as a monolayer on glass. *Br. abortus* invaded bovine cells from foetal skin and kidney as well as adult uterine mucosa, testicle, spleen, bone marrow, and lung and multiplied rapidly within them. Similar intracytoplasmic growth was observed in cells from various tissues.

*Br. abortus* type I multiplied to the same extent in cells from foetal skin and adult uterine mucosa. Types I and II, both CO<sub>2</sub>-

dependent and CO<sub>2</sub>-independent strains, invaded and multiplied within foetal skin cells at about the same rate.

Wallace, N. M. (1959). ***Brucella abortus* associated with abortion in a sow.**—N.Z. vet. J. 7, 106. 1338

*Br. abortus* was recovered from the stomach contents of 2 aborted pig foetuses, but a blood sample taken from the sow 8 weeks later was negative for *Br. abortus* and leptospira. Another sow that had farrowed normally, however, gave a titre of 1:10 for *Br. abortus*. Two cows on the farm had aborted from *Br. abortus* infection a few weeks previously.—M.G.G.

Rolle, M. (1959). Organotropismus der Brucellen bei nicht immunen und immunisierten Meerschweinchen. [**Distribution of brucella in organs of susceptible and immune guinea-pigs.**] — Zbl. VetMed. 6, 714-722. [Summaries in English, French and Spanish.] 1339

*Br. abortus* was recovered mainly from the lymph nodes and spleen in g.pigs infected by various routes, and also from the uterus in pregnant animals. The regional lymph nodes were infected as early as 1-3 days after s/c infection in the flank. Multiplication did not occur in the blood and musculature. Smaller numbers of brucella were recovered if the g.pigs had previously received vaccine or immune serum. Latent infections were activated by giving a killed vaccine.—M.G.G.

Dobberkau, P. (1959). Zur Schutzimpfung der Rinder mit Abortus-Bang-Totimpfstoff. [**Immunization of cattle with killed brucella vaccine.**]—Mh. VetMed. 14, 479-480. 1340

In 3 herds of 250, 120 and 60 cows in which serologically proven *Br. abortus* infection occurred, abortion was prevented by giving a killed *Br. abortus* vaccine (Dessau) to all cows irrespective of stage of pregnancy (2 injections with a short interval between them, followed 6-7 months later by at least one, and preferably two booster doses). [See also V.B. 29, 987.]—W. K. DUNSCOMBE.

Muromtsev, S. N., Kolyaditskaya, L. S. & Vinogradova, I. N. (1959). [**Deep aerated cultivation for the production of brucella vaccines.**]—J. Microbiol., Moscow 30, No. 10 pp. 76-78. [In Russian.] 1341

The authors reported their experience of producing the BA variant of *Br. abortus* Strain 19 by submerged, aerated cultivation.

—R.M.



Alton, G. G. (1960). **The occurrence of dissociated strains of *Brucella melitensis* in the milk of goats in Malta.**—J. comp. Path. 70, 10-17. [Author's conclusions modified.] 1342

Dissociated strains of *Br. melitensis* occurred frequently in the milk of goats in Malta. They appeared to be less pathogenic and markedly less agglutinogenic for rabbits than smooth strains. Agglutinin-absorption methods demonstrated an antigen in these dissociated strains which could not be demonstrated in smooth strains. Suspensions of dissociated cells were somewhat resistant to agglutination by sera prepared against smooth strains of either *Br. abortus* or *Br. melitensis*.

Vershilova, P. A. & Grekova, N. A. (1959). [Reaction of guinea pigs infected with *Brucella melitensis* to the inoculation of live *brucella vaccine*.]—J. Microbiol., Moscow 30, No. 10 pp. 37-43. [In Russian. English summary modified.] 1343

*Br. abortus* Strain 19-BA vaccine was administered to g.pigs s/c or i/d during generalized *Br. melitensis* infection (6 weeks after infection) or declining infection (after 7.5 months). It provoked allergy and caused considerable pathological changes in organs; by disturbing their functional activity, the vaccine aggravated the course of infection. It was concluded that animals or persons already infected with *Br. melitensis* should not be inoculated with live vaccine.

Olitzki, A. L. (1959). **Studies on the antigenic structure of virulent and nonvirulent brucellae with the aid of the agar gel precipitation technique.**—Brit. J. exp. Path. 40, 432-440. [Author's summary modified.] 1344

*Br. abortus*, *Br. melitensis* and *Br. suis* possess at least 6 soluble antigens, which could be demonstrated by the agar gel precipitation technique. These antigens differed in their relative concentration in bacterial extracts of different origins and in their ability to produce antibody titres in immune sera. No antigen specific for a single species was demonstrated among these antigens.

Burgdorfer, W. (1959). **The possible role of ticks as vectors of leptospirae. II. Infection of the ixodid ticks, *Dermacentor andersoni* and *Amblyomma maculatum*, with *Leptospira pomona*.**—Exp. Parasit. 8, 502-508. [Author's summary modified.] 1345

*D. andersoni* and *A. maculatum* became infected with *L. pomona* after ingesting a

heavy suspension of leptospirae in Verwoort's medium.

The organisms penetrated the gut wall and infected salivary glands, central ganglion and genital system of the ticks. Leptospirae could not be detected in developing eggs.

When fed individually or in groups on weanling g.pigs, infected ticks of both species transmitted *L. pomona*.

Attempts to infect ticks by feeding them on infected hamsters were unsuccessful; although leptospirae were ingested with the hosts' blood, they did not survive more than 10 days.

Galton, M. M. (1959). **The epidemiology of leptospirosis in the United States with special reference to wild animal reservoirs.**—Sthwest. Vet. 13, 37-42. 1346

A review of the literature.—M.G.G.

Zaharija, I. (1959). **Prirodna i eksperimentalna leptospiroza (*Leptospira pomona*) u teladi. [Spontaneous and experimental *Leptospira pomona* infection in calves.]**—Vet. Arhiv. 29, 280-292. [In Croat. Summaries in English and French.] 1347

*L. pomona* was isolated from the blood of calves in Croatia during an outbreak of a febrile disease, characterized by icterohaemoglobinuria and high mortality. The outbreak was controlled by penicillin and streptomycin. With the isolated strains the disease was reproduced experimentally in calves. Those, however, with agglutination-titres of 1:100-1:500 against *L. hyos*, resisted infection.—E.G.

Morter, R. L., Ray, J. A. & Chapel, D. F. (1959). ***Leptospira pomona* isolation from naturally occurring canine infections.**—J. Amer. vet. med. Ass. 135, 570-571. [Authors' summary modified.] 1348

Six dogs and 6 cattle on the same farm were found serologically positive for *L. pomona*. The isolation of *L. pomona* from the urine of 2 dogs indicates that the dog may be part of the epidemiological pattern in this disease.

Ellinghausen, H. C., Jr. (1959). **Nephelometry and a nephelo-culture flask used in measuring growth of leptospirae.**—Amer. J. vet. Res. 20, 1072-1076. [Author's summary modified.] 1349

The growth of *Leptospira pomona* was measured by opacity in a new, commercially available nephelometer-culture flask.



Yanagawa, R., Hiramune, T. & Ishii, S. (1959). **Cultural studies on leptospirae. II. On a factor for colonial growth of leptospirae.**—Jap. J. vet. Sci. 21, 221-226. [In English. Summary in Japanese. For part I see V.B. 30, 49.] 1350

Growth of nine serotypes on Cox's solid medium was more rapid under microaerophilic conditions, particularly in the presence of 1% CO<sub>2</sub>.—R.M.

I. Quinlivan, T. D. & Wedderburn, J. F. (1959). **Bacillary haemoglobinuria in cattle in New Zealand.**—N.Z. vet. J. 7, 113-115. 1351

II. Marshall, S. C. (1959). **The isolation of *Clostridium haemolyticum* from cattle in New Zealand.**—Ibid. 115-119. [Authors' summaries modified.] 1352

I. Two cases are described, one of which was confirmed. It is presumed that *Clostridium haemolyticum* has been the cause of sporadic cases of haemoglobinuria in the southern Wairarapa for many years.

II. *Cl. haemolyticum* was isolated from one of two cases of bacillary haemoglobinuria and 8 further strains were isolated from specimens submitted for routine examination. The strains were morphologically and culturally identical and all produced a potent toxin. The results suggest that *Cl. haemolyticum* is present in many areas in New Zealand.

Chodnik, K. S., Watson, A. R. A. & Hepple, J. R. (1959). **Active immunisation of sheep and horses against tetanus with aluminium-hydroxide-adsorbed toxoid.**—Vet. Rec. 71, 904-909. 1353

Ewes and lambs were inoculated with tetanus toxoid adsorbed on aluminium hydroxide, either alone or along with toxoid of *Clostridium welchii* Type D. Two preliminary doses were given 3-4 weeks apart, followed by a booster dose some months later. Satisfactory antitoxin titres against both antigens developed, particularly in young animals, and those immunized with tetanus toxoid alone resisted challenge with *Cl. tetani* toxin 7-8 months later. Good antitoxin titres were observed in 16 horses given 2 i/m doses of tetanus toxoid 3-4 weeks apart; local reactions were prevented by adsorbing concentrated toxoid on a much smaller quantity of aluminium hydroxide.—M.G.G.

Gitter, M. (1959). **Botulism in mink: an outbreak caused by type C toxin.**—Vet. Rec. 71, 868-871. [Author's summary modified.] 1354

In an outbreak of botulism on a small mink farm, 15 animals (the entire stock) died within 19 hours of eating the affected meal; *Clostridium botulinum* Type C toxin was demonstrated in the food.

Mitscherlich, E. & Prange, H. (1959). Die Vibriosis genitalis des Rindes. [**Genital vibriosis in cattle.**]—Dtsch. tierärztl. Wschr. 66, 521-526 & 559-564. [Summary in English.] 1355

The incidence of *V. fetus* infection in the German Federal Republic was discussed. In Lower Saxony cultural and serological examinations revealed that in the winter of 1957/58 15% of 1,315 cows and heifers and 40% of 161 herds were infected. In the winter of 1958/59 12% of 1,664 animals and 41% of herds were infected. Complement-fixation tests on serum from 783 bulls at 63 A.I. centres resulted in positive reactions in 4%. The reactors were stationed at 13 of the A.I. centres. 5.6% of sera from 535 bulls used for natural service reacted to the c.f. test.

A method for controlling the disease was outlined.—R.M.

Deas, D. W. (1960). **Observations on swine dysentery and associated vibrios.**—Vet. Rec. 72, 65-68 & 69. [Author's summary modified.] 1356

Swine dysentery of weaned pigs associated with acute and subacute colitis is described. From the colon and mesenteric lymph nodes of affected pigs two types of vibrio were isolated, one biochemically and morphologically similar to *V. fetus*. Attempts to set up the condition in susceptible pigs using both types of vibrio were unsuccessful. Vibrio was isolated from 15 of 28 normal bacon pigs and it was concluded that vibrio is a normal commensal of the pig's colon.

Heinrich, S., Pulverer, G. & Hauf, U. (1959). Über das physiologische Vorkommen des Bacteroides melaninogenicus bei Mensch und Tier. [**Occurrence of Fusiformis (Bacteroides) melaninogenicus in healthy human beings and animals.**]—Schweiz. Z. allg. Path. 22, 861-870. 1357

This organism is a common inhabitant of the mouth, intestines and external genital organs of human beings and the mouth of g.pigs, rabbits and dogs. The authors found



it also in the oral cavity of a high proportion of cattle, sheep and pigs. Pathogenicity was not tested.—R.M.

Cavrini, C. & Bonani, V. (1959). Ricerche batteriologiche su farine animali importate. [**Bacteriological study of fish and meat meal imported into Italy.**]—Clin. vet., Milano 82, 305-310. [Summary in English.] 1358

Seven salmonella strains, of 6 types, and a pathogenic staphylococcus were isolated from 8 of 40 samples of imported fish and meat meal. Stricter control of these imports is recommended.—M.G.G.

Hobbs, B. C. & Wilson, J. G. (1959). **Contamination of wholesale meat supplies with salmonellae and heat-resistant Clostridium welchii.**—Mon. Bull. Minist. Hlth Lab. Serv. 18, 198-206. 1359

In 3 years salmonella was isolated from 92 of 890 samples of imported, frozen, boneless meat and from 13 of 304 samples of imported, chilled carcass meat. Heat-resistant *Cl. welchii* was recovered from 76 of 722 samples of boneless meat and from 3 of 195 samples of carcass meat. The recoveries were not correlated with the presence of coliform bacilli and high plate counts.—M.G.G.

Berthelon, M. (1959). Résultats de l'inoculation directe de germes au fœtus. [**Experimental infection of sheep foetuses with streptococci and enterobacteriaceae.**]—Rev. Méd. vét. 110, 793-800. [Summaries in English and Spanish.] 1360

The following organisms were used: a streptococcus isolated from lambs dying at the age of 8-10 days, a streptococcus isolated from a mare with purulent metritis, *Escherichia coli* from the bone marrow of a lamb dying a few days after birth, *E. freundii* and *Proteus vulgaris* from the bone marrow of aborted foals. When these organisms, some of which were non-pathogenic for adult animals, were introduced i/m into the foetus, amniotic fluid or surface of the placenta in pregnant ewes, the foetus died rapidly and was aborted.—M.G.G.

Zettl, K. & Kauker, E. (1959). Das Vorkommen von Milzbrand und Rauschbrand in der Deutschen Bundesrepublik. [**Incidence of anthrax and blackleg in the German Federal Republic.**]—Berl. Münch. tierärztl. Wschr. 72, 426-429. [Summary in English.] 1361

The geographical and seasonal incidence of anthrax and blackleg in West Germany is

given for the years 1956 to 1958. The number of districts reporting anthrax increased from 128 to 161, the number reporting blackleg fell from 78 to 52. Most outbreaks of anthrax were due to contamination of water-meadows by effluent from tanneries and animal hair industries and to the use of wastes from these industries as fertilizer. Blackleg occurred mainly in north-west Germany and in Upper Bavaria.—M.G.G.

Behrens, H. & Löliger, H. C. (1959). Neben-hodenentzündungen bei Schafböcken. [**Epididymitis in rams.**]—Zuchthyg. Fortpfl.-Störung. u. Besamung 3, 243-251. 1362

Epididymitis with abscess formation was the cause of reduced conception rates in two flocks of sheep. Among the bacteria isolated were *Escherichia coli* and staphylococci; but their aetiological role was doubtful. Serological examination for brucellosis was negative, and brucella-like organisms, as described by Australasian and Czechoslovak authors, were not demonstrable. Histologically there was scanty irregular lymphocytic infiltration of epididymal interstitial tissue. Lesions in testicular tissue were slight. In certain respects the condition resembled the form of epididymitis described in goats with seminal congestion [*V.B.* 28, 1335 & 2029].

—E.G.

Vereninova, N. K. et al. (1959). [**Efficacy of a combined live vaccine against plague, tularaemia, brucellosis and anthrax. II. Degree of immunity of guinea pigs to intratracheal challenge.**]—J. Microbiol., Moscow 30, No. 11 pp. 19-24. [In Russian. Summary in English. For Part I see *V.B.* 29, 1719.] 1363

The combined vaccine gave satisfactory immunity to intratracheal inoculation of the causative agents alone or together, except in the case of anthrax.—R.M.

van Triet, A. J. (1959). **Enzymatic purification of antidipteria and antitetanus sera obtained from sheep.**—Brit. J. exp. Path. 40, 559-566. [Author's summary modified.] 1364

By using an enzymic purification process a refined product containing relatively little protein and few species-specific elements was obtained. At the same time the antitoxin content was so much increased by concentration that the purified sheep antidipteria serum could also be used therapeutically.

The practical aspects of the use of sheep sera in addition to horse sera are discussed.



I. Schaedler, R. W. & Dubos, R. J. (1959). **Effect of dietary proteins and amino acids on the susceptibility of mice to bacterial infections.**—J. exp. Med. 110, 921-934. [Abst. from authors' summary.] 1365

II. Dubos, R. J. & Schaedler, R. W. (1959). **Effect of nutrition on the resistance of mice to endotoxin and on the bactericidal power of their tissues.**—Ibid. 935-950. [Authors' summary modified.] 1366

I. Young mice were maintained for periods of 1 to 6 weeks on diets containing all known growth factors, but differing in their protein and amino-acid contents. All diets were supplemented with L-cystine.

The effect on infection was tested by inoculating the animals with either *Mycobacterium tuberculosis* var. *bovis*, *M. fortuitum*, *Staphylococcus aureus*, or *Klebsiella pneumoniae* Type C, and by observing the survival time. The infective dose was administered either intravenously, intraperitoneally, or by aerosol.

The relative proportion of various amino-acids in the diet was as important as their total amount in conditioning resistance to infection. This effect could be detected irrespective of the route of infection and was observed with two strains of mice differing markedly in their natural resistance to bacterial infection.

II. Mice on inadequate diets were more susceptible to various bacterial diseases than mice fed a complete diet containing 15 to 20% casein. The infection-enhancing effect could be enhanced by administering the infective inoculum simultaneously with a sublethal dose of endotoxin.

Despite their great susceptibility to infection, malnourished animals retained much of their ability to eliminate bacteria from the blood, liver, spleen, kidneys, and lungs, at least during the early phases of infection. This was true even when the animals had received endotoxin simultaneously with the infective dose.

The results suggest that nutritional status influenced the outcome of infection not primarily by affecting the fate of the pathogens in the animal, but rather by modifying the ability of the host to resist their toxic effects.

Leach, R. H. & Scott, W. J. (1959). **The influence of rehydration on the viability of dried micro-organisms.**—J. gen. Microbiol. 21, 295-307. [Authors' summary modified.] 1367

Considerable mortality may occur in freeze-dried preparations of certain organisms during reconstitution to the wet state. In preliminary tests the organism of bovine contagious pleuropneumonia and two coliphages were affected by the volume of water used for rehydration, but no significant effects were observed with nine other bacteria. Comparisons of rehydration at several temperatures showed greatest destruction at 37° for *V. metchnikovi*, but at 0° for three other bacteria. The importance of rehydration rates and of exposure to hypotonic solutions is discussed.

El-Fiki, A. Y., Rieth, H. & Bisping, W. (1959). **Nachweis pathogener Hefen in der Tiermedizin. [Demonstration of pathogenic yeasts in veterinary medicine.]**—Dtsch. tierärztl. Wschr. 66, 564-567. [Summary in English.] 1368

The preparation and use of rice agar was described.—R.M.

Scholer, H. J. (1959). **Experimentelle Aspergillose der Maus (*Aspergillus fumigatus*) und ihre chemotherapeutische Beeinflussung. [Experimental aspergillosis in mice and its chemotherapy.]**—Schweiz. Z. allg. Path. 22, 564-576. 1369

Six strains of *Aspergillus fumigatus* were used. Intravenous inoculation of about a million or more spores caused fatal generalized infection in mice. Distribution of spores within the body was described. Nystatin, hydroxystilbamidine and amphotericin B all had a therapeutic action as judged by prolonged period of survival, lower incidence of lesions in kidney, and fewer isolations of fungus from kidney compared with untreated animals.

—R.M.

O'Meara, D. C. & Chute, H. L. (1959). **Aspergillosis experimentally produced in hatching chicks.**—Avian Diseases 3, 404-406. [Authors' summary.] 1370

Chicks in the process of hatching and up to two days of age were easily infected with *Aspergillus fumigatus* spores by contaminating the forced draft incubator with wheat which had been seeded with *A. fumigatus*. Chicks older than three days of age were resistant to infection.

Kanazawa, K. & Imai, A. (1959). **Pure culture of the pathogenic agent of Tyzzer's disease of mice.**—Nature, Lond. 184, Suppl. No. 23 pp. 1810-1811. 1371

*Actinobacillus piliformis* was isolated in liver extract agar from mice with a hepatic



disease indistinguishable from Tyzzer's disease. Cultural and biochemical characteristics and sensitivity to antibiotics are described. It reproduced the disease when inoculated i/v into mice. Both naturally and experimentally infected mice reacted to c.f. tests.—M.G.G.

✓ Janes, B. S. (1959). *Sporidesmium bakeri* recorded from Victoria, Australia.—*Nature*, Lond. 184, Suppl. No. 17 p. 1327. 1372

The recovery of *Sporidesmium bakeri* from pastures in southern Victoria is reported, an area in which facial eczema has appeared. The fungus is being administered to experimental sheep.—M.G.G.

I. Villemot, J. M. & Provost, A. (1959). Recherches immunologiques sur la péripneumonie. III. Isolement au Tchad de P.P.L.O. génitaux d'origine bovine. [Immunological studies on pleuropneumonia. III. Pleuropneumonia-like organisms in the genital tract of cattle.]—*Rev. Elev.* 12, 5-10. 1373

II. Provost, A. & Villemot, J. M. (1959). Recherches immunologiques sur la péripneumonie. IV. A propos du diagnostic de laboratoire de la pleuropneumonie contagieuse caprine. [Immunological studies on pleuropneumonia. IV. Laboratory diagnosis of caprine contagious pleuropneumonia.]—*Ibid.* 11-19. [Summaries in English and Spanish.] 1374

I. PPLO were isolated from 39 of 134 Arab zebu cows in Chad territory. Eleven strains were examined in detail: 5 had the biochemical properties of the pathogenic variety described by Edward (1950) and the remainder were saprophytic.

II. Sera from cattle were tested for their ability to agglutinate suspensions of PPLO from caprine pleuropneumonia, bovine pleuropneumonia and from the genital tract of cattle in Chad. Serum from a healthy French cow did not agglutinate any of the antigens; serum from a case of bovine pleuropneumonia agglutinated the pleuropneumonia antigens and 3 of 5 genital PPLO; serum from a cow infected with genital PPLO agglutinated one caprine antigen, bovine pleuropneumonia antigen to a lesser extent, and 3 of 5 genital PPLO. The authors criticized the test for caprine pleuropneumonia described by Manjrekar *et al.* [*V.B.* 28, 2450], based on agglutination of suspensions of lung exudate by normal ox serum, and suggested that

success of this test depended on the use of serum from cattle infected with genital PPLO.—R.M.

Lancaster, J. E., Goswami, J. N. & Rienzi, A. A. (1960). Observations on the spread of pleuropneumonia-like organisms of chickens. —*Canad. J. comp. Med.* 24, 10-16. [Authors' abst. modified.] 1375

The spread of PPLO infection on an infected poultry farm was studied, using the haemagglutination-inhibition (H.I.) diagnostic test [See *V.B.* 25, 2747].

In one pen of 400 adult fowls, the organism spread rapidly by direct contact and was dust borne over a short distance. When the serological test showed that 90% or more of the birds had H.I. antibodies, active excretion of the organism ceased. Results also indicated that the organism was unable to survive in the dust and litter. Thus a number of other pens of chickens remained H.I.-negative for a period of 15 months.

Anisimov, I. N. (1959). [Diseases of respiratory organs in chicks, ducklings and turkey poults.]—*Veterinariya*, Moscow 36, No. 10 pp. 23-25. [In Russian.] 1376

Infectious sinusitis was diagnosed on one farm in Moscow oblast where 10,000 of 15,000 turkey poults had died. The disease was experimentally transmitted to ducks. Losses amongst ducklings and chicks on the same farm were not high.—R.M.

Valotta, J. R. (1959). Flora uretral y vesical del caballo macho. [Bacterial flora of urethra and bladder in stallions.]—*Rev. Milit. Vet.*, B. Aires 7, 147-149. 1377

A sample of urine was obtained from ten stallions aged 7-18 years. The following organisms were isolated: 6 strains of staphylococcus, 5 of streptococcus, 1 of sarcina, 6 of *Escherichia coli* and 4 of *Pseudomonas aeruginosa*. All ten samples were alkaline and turbid, and contained no proteins or glucose. Density was 1.040-1.043. —M.G.G.

Bladen, H. A. & Doetsch, R. N. (1959). Physiological activities of rumen mixed cell suspensions.—*J. agric. Food Chem.* 7, 791-794. [Authors' summary modified.] 1378

An attempt was made to determine some of the factors in the production of volatile fatty acids and lactic acid by washed rumen bacteria. Refrigeration or freezing of washed cell suspensions yielded preparations that did not give results comparable to those obtained



from untreated washed suspensions. Time of sampling after feeding and variations in the concentration of buffer and substrate affected both the quantity and ratio of volatile and lactic acids. The length of the incubation period

influenced the quantity produced. Rumen fluid appeared to have an inhibitory effect on the production of volatile acids. Reactions that required incubation for many hours gave variable results.

See also *absts.* 1395 (losses due to F. & M. disease and brucellosis vaccination); 1662 (report C.S.I.R.O., Australia); 1663-1666 (reports, Nyasaland); 1667 (report, Uganda); 1668 (report, British Guiana); 1669 (report, Netherlands); 1670 (report, California); 1672 (book, poultry diseases).

## DISEASES CAUSED BY PROTOZOAN PARASITES

Desowitz, R. S. (1959). **Studies on immunity and host-parasite relationships. I. The immunological response of resistant and susceptible breeds of cattle to trypanosomal challenge.**—*Ann. trop. Med. Parasit.* 53, 293-313. [Author's summary modified.] 1379

The course of infection, immune response and changes in serum-protein patterns after challenge with *Trypanosoma vivax* are described and compared in cattle of three breeds (zebu, N'Dama and Muturu).

In zebu cattle born and bred in a tsetse area, a chronic type of infection occurred after a series of intense parasitaemic attacks. There was a causal relationship between antibody titre and parasitaemia. In N'Dama cattle born and bred in a tsetse area, a hyperimmune reaction occurred. A scanty transient parasitaemia terminating in self-cure resulted after challenge. A high antibody titre was elicited and sustained for at least 100 days. Antibody could still be detected two years after challenge.

In N'Dama cattle born and bred in a tsetse-free area but the progeny of dams capable of eliciting a hyperimmune response, there occurred a type of infection and immune response similar to that described for zebu cattle.

In Muturu cattle obtained from a herd isolated from trypanosomal challenge for many generations an acute infection occurred, the animals dying about 25 days after challenge. The immune response in these animals was feeble.

There are indications that, whereas the  $\gamma$ -globulin component in challenged zebu and partially immune N'Dama consists of two components, in hyperimmune N'Dama a third  $\gamma$ -globulin component is present.

Lyttle, C. N. (1960). **Field trials of Prothidium as a prophylactic in cattle trypanosomiasis.**—*J. comp. Path.* 70, 18-35. [Author's conclusions modified.] 1380

Experiments are described in which zebu and grade cattle protected by Prothidium were

grazed in areas of high and low tsetse density. After a single injection at 2 mg./kg. or 4 mg./kg., blood smears from the cattle remained negative for periods of 5 to 8 months. Following a second injection of Prothidium drug resistance appeared in both areas and attempts were made to eliminate the resistant strains of trypanosomes by using other drugs. By the use of Antrycide pro-salt, followed by "Berenil" seven days later, it was possible to keep the peripheral blood free from trypanosomes until the cattle were sent for slaughter.

Stephen, L. E. (1960). **The prophylactic and therapeutic activity of metamidium and its suramin salt against trypanosomiasis in cattle.**—*Vet. Rec.* 72, 80-84. [Author's summary modified.] 1381

Metamidium chloride at 10 mg./kg. was toxic for cattle in Nigeria. When injected i/m at 5 mg./kg. it caused some weight loss and initial local swelling but the effects were not serious. Protection against infection for at least 204 days resulted.

The suramin salt of metamidium provided protection for at least 111 days with 10 mg./kg. and 128 days with 20. No toxicity was evident at either dosage.

All trypanosomes resistant to the drug or its suramin salt were *T. congolense*.

Kaltenbach, A. (1959). Untersuchungen über die Resistenzbildung eines Stammes von *Trypanosoma equiperdum* gegenüber Stilbamidin. [Development of resistance of a strain of *Trypanosoma equiperdum* to stilbamidine.]—*Wien. tierärztl. Mschr.* 46, 639-650. [Summaries in English, French and Italian.] 1382

During 36 passages in mice treated with gradually increasing doses of stilbamidine, *T. equiperdum* became resistant to a dose of 0.1 mg./20 g. body wt. After a dose of 1 mg./20 g. it disappeared from the circulating blood but relapses occurred. Fluorescence microscopy revealed that the resistant strain absorbed as much stilbamidine as the parent



strain, but the percentage of trypanosomes with cytoplasmic granules was much greater and multiplication much slower in the resistant strain.—M.G.G.

Bierer, B. W., Vickers, C. L. & Thomas, J. B. (1959). **A parasitism in turkeys due to a Hemoproteus-like blood parasite.**—J. Amer. vet. med. Ass. 135, 181-182. 1383

A parasite with the morphological and staining characteristics of *Haemoproteus* was observed in the r.b.c. of sick and dead birds in a flock of 600 turkeys in South Carolina. *Leucocytozoon smithi* was present also. Infection with *Haemoproteus* was not established in 5 poults by i/p injection of organ material from a heavily parasitized turkey. Blood smears from another heavily infected turkey were free from the parasite after 41 days. Wild turkeys in the vicinity may have been the source of the infection.

—M.G.G.

Canache Mata, E. A. (1959). Observaciones sobre infestacion experimental con *Babesia rodhaini* en ratones. [Experimental infection of mice with *Babesia rodhaini*, with reference to "Berenil" therapy.]—Rev. vet. venez. 7, 71-113. 1384

The course of the disease is described in detail and there are illustrations of lesions. For effective treatment the dosage of "Berenil" ("Ganaseg") was 50 mg./kg. body wt.—R.M.

Seeman, J. (1959). Sérologické nálezy toxoplasmózy u koní a jiných domácích zvířat. [Serological examination for toxoplasmosis in horses and other domestic animals.]—Čsl. Epidem. Mikrobiol. Imunol. 8, 228-234. [In Czech. Summaries in English and Russian.] 1385

In Czechoslovakia 523 horses, 144 pigs, 94 cats and 34 dogs were examined by the complement-fixation test for toxoplasmosis; 129 horses, 17 pigs, 36 cats and six dogs yielded positive titres.—E.G.

Čatár, G., Ernek, E. & Mačička, O. (1959). Sérologické vyšetřovanie niektorých domácich

zvierat na toxoplazmózu. [Serological examination of some domestic animals for toxoplasmosis.]—Vet. Čas. 8, 438-443. [In Slovak. Summaries in English, French, German and Russian.] 1386

In a serological survey for toxoplasmosis in a district of Slovakia, complement-fixing antibodies were demonstrated in 113 of 429 sheep, 141 of 521 goats and in 44 of 433 cattle.—E.G.

Rohde, R. (1959). Der Toxoplasminhauttest beim Hund, ein diagnostisches Hilfsmittel für die Praxis. [Toxoplasmin skin test in dogs.]—Mh. VetMed. 14, 594-597. 1387

R. examined 203 clinically normal dogs in Berlin by the toxoplasmin test described by Frenkel (1948). Of the 38 that gave a positive reaction, all had positive titres (ranging from 1:4 to 1:256) to the dye test on serum.

—R.M.

Simitch, T., Pétrovitch, Z., Bordjochki, A. & Tomanovitch, B. (1959). Contribution à la connaissance de la virulence de *Toxoplasma gondii* pour *Carduelis carduelis* L. [Virulence of *Toxoplasma gondii* for goldfinches.]—Arch. Inst. Pasteur Algér. 37, 409-411. 1388

All of 72 *C. carduelis* infected orally or intraperitoneally with 500,000 *T. gondii* died within 24 days. Microscopic examination of the organs revealed toxoplasma in 60.

—M.G.G.

Thompson, P. E., Bayles, A., Herbst, S. F., Olszewski, B. & Meisenhelder, J. E. (1959). Antiamoebic and antitrichomonal studies on the antibiotic paromomycin (humatin) in vitro and in experimental animals.—Antibiot. & Chemother. 9, 618-626. [Summary in Spanish pp. 639-640.] 1389

The drug prevented death of mice inoculated intraperitoneally with 50,000 organisms of *Trichomonas foetus*. It was injected i/p commencing 45 min. after infection in 4 daily doses each of 130 mg./kg. It was also active against *Entamoeba histolytica* and cured amoebic dysentery in 6 of 7 dogs.—R.M.

See also absts. 1662 (report C.S.I.R.O., Australia); 1663-1666 (reports, Nyasaland); 1667 (report, Uganda); 1668 (report, British Guiana).

## DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Strohmaier, K. & Uhlmann, W. (1960). Über die quantitativen Beziehungen zwischen Antigenkonzentration und Serumtiter beim Neutralisations-test gegen das Virus der Maul- und

Klauenseuche vom Typ O. [Quantitative relationships between the antigen concentration and the serum titre in the neutralization test for foot and mouth disease.]—Zbl.



VetMed. 7, 1-14. [Summaries in English, French and Spanish. English summary modified.] 1390

When the reaction mixture was injected intraperitoneally into unweaned mice there was a linear relationship between the logarithm of the virus concentration and the serum titre.

When tissue cultures were used for the test the relationship was linear only with low concentrations of antigen and differed from the results with mice at other levels.

Lübke, A. (1959). Durchbrechung einer angeborenen Resistenz gegenüber der Infektion mit dem Maul-und-Klauenseuche-Virus durch körperliche Anstrengung. I. Mitteilung. [Breakdown of congenital resistance to foot and mouth disease virus by physical exertion. I.]—Mh. Tierheilk. 11, 291-295. 1391

The high congenital resistance of a strain of mice to F. & M. disease virus was greatly reduced by forcing them to swim for 25 min. on the day of experimental infection and for 3 periods of 25 min. on each of the following 4 days.—M.G.G.

Ubertini, B., Nardelli, L., Santero, G. & Panina, G. (1960). Konzentration des Maul-und-Klauenseuche-Virus in der Kulturflüssigkeit mittels Verdunstung im Vakuum. [Concentration of foot and mouth disease virus in culture fluid by evaporation in vacuum.]—Zbl. VetMed. 7, 15-21. [Summaries in English, French and Spanish. English summary modified.] 1392

A description is given of the concentration of virus cultured in kidney cells or in tongue epithelium. It was possible to concentrate the virus to at least one-tenth of its original volume without loss in infectivity or complement-fixing antigen.

Jansen, J. (1959). Plotselinge dood van runderen direct na de mond- en klauwzeerenting. [Sudden death in cattle due to injection of foot and mouth disease vaccine into blood vessels.]—Tijdschr. Diergeneesk. 84, 1306-1311. [In Dutch. Summaries in English, French and German.] 1393

In the Netherlands all cattle are inoculated annually against F. & M. disease. There have been occasional reports of sudden death directly after inoculation, and in one case it was shown that the needle had accidentally entered the carotid artery. Experiments on rabbits and calves confirmed that intravascular inj. of adsorbed vaccine could cause death

within 6 min. The vaccine or a suspension of aluminium hydroxide alone in dilutions not exceeding 1:1024 agglutinated bovine erythrocytes. It was believed that death resulted from damage to capillaries from agglutination of erythrocytes by aluminium hydroxide. After injection into the carotid artery this damage occurred particularly in the brain, while after injection into a vein the lesions were mainly in the lungs.—R.M.

Lucam, F. (1959). Résultats des vaccinations anti-aphteuses faites en France, pendant l'année 1957. [Results of vaccination against foot and mouth disease in France in 1957.]—Rev. Méd. vét. 110, 859-879. [Summaries in English and Spanish.] 1394

In 1957, out of 56,440 farms where the animals were given trivalent vaccine after F. & M. disease had broken out in the vicinity, the disease appeared in only 146 (0.25%). 53 of the failures occurred within a fortnight of vaccination and were attributed to infection before immunity became established or to virulence of the vaccine, the remaining 93 were regarded as vaccination breaks.

—M.G.G.

Hausmann, W. (1960). Zur Frage der Tierverluste nach Schutzimpfungen. [Losses due to inoculation of vaccines against brucellosis and foot and mouth disease.]—Dtsch. tierärztl. Wschr. 67, 75-76. [Summary in English.] 1395

H. estimated that in the period 1956/58 in Bavaria 3.8 million cattle were inoculated with F. & M. disease adsorbed vaccine and 268 (0.007%) died or had to be slaughtered from causes attributable to vaccination such as fractures, heart failure, shock, anaphylaxis, abortion, transmission of infection by contaminated needles, activation of latent infections. Similarly 7 cattle were lost out of 186,000 inoculated once or twice with Strain 19 vaccine. These losses were regarded as insignificant and did not justify abandoning immunization.—R.M.

Lukashev, I. I., Nikitina, V. S. & Nikitin, M. G. (1959). [Prophylactic and therapeutic action of gamma globulin in Aujeszky's disease.]—Veterinariya, Moscow 36, No. 9 pp. 24-26. [In Russian.] 1396

Further trials with the gamma-globulin preparation described earlier [V.B. 29, 1048] showed that it was greatly superior to hyperimmune serum. When used to protect pigs in contact with infection, it protected all except



4 of 601 pigs whereas hyperimmune serum protected only 90 of 284 pigs. In therapeutic doses of 4-6 ml. of 10% soln. for month-old pigs and 6-8 ml. for adults it cured 121 of 196 pigs compared with only 37 recoveries in 417 treated with serum. The cost of globulin therapy was about twice that of serum therapy.—R.M.

Linsert, H., Templin, G. & Wolter, R. (1959). Die Komplementbindungsreaktion als Diagnostikum bei Routineuntersuchungen auf Tollwut. [The complement-fixation reaction in routine diagnosis of rabies.]—Berl. Münch. tierärztl. Wschr. 72, 323-325. [Summary in English.] 1397

The c.f. test was reliable for diagnosis of rabies. Details were given of examination of brain material from a number of suspected animals. The c.f. reaction was positive in all animals in which Negri bodies were demonstrable and also in about 23% in which Negri bodies were not demonstrable. Diagnosis by isolation of the virus in experimental animals was also described.—E.G.

Kodrnja, E. (1959). Deset godina suzbijanja bjesnoće. [Ten years of rabies control in Yugoslavia.]—Vet. Arhiv 29, 132-144. [In Croat. Summaries in English and French.] 1398

Control by vaccination of registered dogs and destruction of strays was initiated in 1947. Between 1947 and 1957 nearly 6,400,000 dogs were vaccinated and over one million were destroyed. The present dog population was estimated at over 1,600,000. During 1947 there were 1,610 cases reported in animals and 73 in man. In 1957 the incidence decreased to 81 in animals and 4 in man. The total number of cases recorded during 1946-1957 was 338 in man, 166 in horses and donkeys, 1,542 in cattle, 772 in sheep and goats, 1,101 in pigs, 5,498 in dogs, 335 in cats, 89 in wolves, 271 in foxes and 7 in badgers.—E.G.

Alba, A. M. (1959). Pathogenesis of rabies in vampire bats. — Canad. J. comp. Med. 23, 391-392. 1399

Observations on rabies in naturally and experimentally infected vampire bats agreed with those of Pawan [see *V.B.* 7, p. 528]. Further studies should include experimental infection by various routes, determination of the virus in the mammary gland and other tissues and of neutralizing antibodies in the blood and milk, and histology of the c.n.s. of carriers and bats dying from rabies.—M.G.G.

Sadler, W. W. & Enright, J. B. (1959). Effect of metabolic level of the host upon the pathogenesis of rabies in the bat.—J. infect. Dis. 105, 267-273. 1400

The incubation period of rabies was much shorter in experimentally infected *Antrozous pallidus* insectivorous bats kept at 37°C. than in those kept at 22°C. The virus was not detectable in bats kept at 4°C. unless they were first kept at 22° for 6 days after infection. In these it multiplied slowly. The incubation time doubled if infected bats were exposed alternatively to 30° for 48 hours and 4° for 48-96 hours, and trebled if they were alternately kept at 30° for 48 hours and 4° for 120 hours. Incubation period varied with season, being shorter in July and September than in April and May.—M.G.G.

Pons, M. W. (1959). The inhibiting effect in vivo of beta-phenylserine in rabies infection in rats. — Dissertation, Michigan Univ. pp. 69. [Abst. from Diss. Abstr. 19, 3088. (1959).] 1401

Beta-phenylserine has previously been shown to inhibit the multiplication of rabies virus in tissue culture. The effect of the compound on the course of the disease in rats and some aspects of the mechanisms involved are reported in this study. For purposes of comparison other host-viral systems were investigated as well as chemically related compounds.

Rao, S. B. V., Thakral, B. M. & Srinivasan, V. V. (1959). Studies in day-old chick immunization against fowl pox using egg-propagated fowl pigeon pox viruses.—Indian J. vet. Sci. 28, 187-196. 1402

The fowl pox virus conferred immunity lasting over one year, as compared to only 8-10 weeks with the pigeon pox virus. Both were generally safe as vaccines, but the former caused secondary lesions on the beak in a few cases and showed greater spread among unvaccinated in-contact chickens, as evidenced by immunity to subsequent challenge and in some cases also by scattered pox lesions.

—R. N. MOHAN.

I. Grešková, M. (1958). Recovery of tick-borne encephalitis virus from the blood and milk of subcutaneously infected sheep.—Acta virol., Prague 2, 113-119. [In English.] 1403

II. Grešková, M. & Reháček, J. (1959). Isolierung des Zeckenenzephalitisvirus aus Blut und Milch von Haustieren (Schaf und



Kuh) nach Infektion durch Zecken der Gattung *Ixodes ricinus* L. [**Isolation of the virus of louping-ill and tick-borne encephalitis from blood and milk of ewes and cows infected by *Ixodes ricinus*.**] — Arch. ges. Virusforsch. 9, 360-364. 1404

I. Six ewes were inoculated s/c with a human strain of Czechoslovakian tick-borne encephalitis virus. The virus was recovered from the blood of all 6 ewes 1-5 days after infection and from the milk of 5 ewes 2-7 days after infection. In the sixth, lactation ceased 2 days after infection. Neutralizing antibodies at high titre were demonstrated in the blood after 3-5 months, and in the milk of one ewe after 3 months.

II. One of 2 ewes excreted louping-ill virus in the milk on the 7th and 8th days after infection by *I. ricinus* ticks and two excreted a human strain of Czechoslovakian tick-borne encephalitis virus between the 3rd and 7th days after infection. The encephalitis virus was recovered from the blood of the two ewes between the 2nd and 6th days after infection and, in a cow infected by ticks, from the blood on the 2nd and 6th days and from the milk on the 3rd and 4th.—M.G.G.

Blaškovič, D. & Grešíková, M. (1959). Kozy, ovce a kravy ako možný rezervoár vírusu kliešťovej encefalitídy. [**Goats, sheep and cattle as possible reservoirs of tick-borne encephalitis virus.**] — Vet. Čas. 8, 423-430. [In Slovak. Summaries in English, French, German and Russian.] 1405

The virus of Czechoslovak tick-borne encephalitis was demonstrated in blood and milk of goats, ewes and cows, infected by s/c injection of a suspension of virus material or by the bite of infected ticks. No clinical symptoms were present in experimentally infected ewes. In goats the virus appeared to localize in the mammary gland. It survived for a considerable time in cheese and butter stored at 4°C. [See also *V.B.* 28, 1051; 29, 2093 & 3820.]—E.G.

Libíková, H. & Albrecht, P. (1959). Patogenita vírusu kliešťovej encefalitídy, izolovaného na Slovensku z *Dermacentor marginatus* Sulz. pre niektoré laboratórne, domáce a voľne žijúce zvieratá. [**Pathogenicity for experimental animals of the virus of tick-borne encephalitis, isolated from *Dermacentor marginatus* in Slovakia.**]—Vet. Čas. 8, 461-477. [In Slovak. Summaries in English, French, German and Russian.] 1406

Mice, rats and hamsters were susceptible

to intracerebral infection with the virus of Czechoslovak tick-borne encephalitis, isolated from *Dermacentor marginatus*. Following intranasal instillation, a rhesus monkey developed severe encephalitis, but there was little or no reaction to s/c injection of the virus. Fowls infected intracerebrally developed cerebellar encephalitis. In kids and lambs intracerebral infection produced a mild form of encephalitis. Pigs were resistant to s/c infection, but traces of healed cerebral lesions were seen P.M. and there was antibody formation. Roe deer and hares apparently resisted s/c infection, hares also intracerebral infection. Following infection the virus was demonstrable for several days in the blood of monkeys, deer and hares, but not pigs.—E.G.

Málková, D. & Fraňková, V. (1959). **The lymphatic system in the development of experimental tick-borne encephalitis in mice.** —Acta Virologica, Prague 3, 210-214. [In English. Authors' summary modified.] 1407

Tick-borne encephalitis virus, injected into the plantar pads of mice, is mainly resorbed from the infected tissue into the blood stream by way of lymph vessels. Partial interruption of the lymph vessels by removal of the regional lymph nodes retards the uptake of the virus into the blood, as seen from the delayed onset of viraemia. By way of the blood the virus invades the whole of the lymphatic system, where it probably multiplies and in which it persists until the death of the infected animal.

Isaacs, A. & Westwood, M. A. (1959). **Duration of protective action of interferon against infection with West Nile virus.** —Nature, Lond. 184, Suppl. No. 16. pp. 1232-1233. 1408

Trypsinized chick embryo cells in maintenance medium containing interferon remained healthy for 11 days after the addition of West Nile virus and viral haemagglutinin was not formed. The medium was changed every 1 or 2 days but no further interferon was added. When cell division was stimulated by the presence of serum and chick embryo extract, resistance to viral infection decreased. This decrease in resistance could be prevented by adding more interferon. It was concluded that cell multiplication lowers resistance by diluting the interferon within the cells.—M.G.G.

I. Buescher, E. L., Scherer, W. F., McClure, H. E., Moyer, J. T., Rosenberg, M., Yoshii,



- M. & Okada, Y. (1959). **Ecologic studies of Japanese encephalitis virus in Japan. IV. Avian infection.**—Amer. J. trop. Med. Hyg. 8, 678-688. 1409
- II. Scherer, W. F., Buescher, E. L. & McClure, H. E. (1959). **Ecologic studies of Japanese encephalitis virus in Japan. V. Avian factors.**—Ibid. 689-697. 1410
- I & II. The virus was isolated from egrets and herons and they were shown to be susceptible to experimental infection. [See also *V.B.* 22, 1321 & 29, 388.]—R.M.
- Scherer, W. F., Moyer, J. T., Izumi, T., Gresser, I. & McCown, J. (1959). **Ecologic studies of Japanese encephalitis virus in Japan. VI. Swine infection.**—Amer. J. trop. Med. Hyg. 8, 698-706. 1411
- In a district near Tokyo most pigs became infected with the virus during August, as judged by antibody titres in blood plasma. Pigs were regarded as the major natural source of virus for the vector mosquito, *Culex tritaeniorhynchus*.—R.M.
- Downs, W. G., Aitken, T. H. G. & Spence, L. (1959). **Eastern equine encephalitis virus isolated from *Culex nigripalpus* in Trinidad.**—Science 130, 1471-1472. [Authors' summary modified.] 1412
- The first isolation of the virus in Trinidad was made from *Culex nigripalpus* mosquitoes collected from chicken-baited traps in May 1959.
- Hurst, E. W., Melvin, P. A., Paget, G. E. & Snow, G. A. (1960). **The extra-neural phase of infection with equine encephalomyelitis virus in the mouse and guinea-pig in relation to the antiviral effect of mepacrine.**—J. comp. Path. 70, 135-144. [Authors' conclusions modified.] 1413
- Study of the systemic phase of infection with equine encephalomyelitis in the mouse and the g.pig revealed no peculiarity in the latter host to explain its insusceptibility to the action of mepacrine.
- During an attempt to localize virus in the subcellular components of the liver cell, a hitherto unsuspected technical flaw was discovered in the method of separation; the nuclear fraction was contaminated heavily with large fragments of protoplasm of ruptured Kupffer cells. The presence of virus in the liver can best be explained on the assumption that it results from phagocytosis of virus by the Kupffer cells during the stage of viraemia, and does not represent an unequivocal growth of virus in this organ.
- Reháček, J. (1959). O možnosti přenosu virusu severoamerické encefalomyelitidy koní východního typu klíšťaty *Ixodes ricinus* L. a *Dermacentor marginatus* Sulz. I. Přenos virusu z klíštěte na klíště. [Transmission of Eastern type American equine encephalomyelitis by *Ixodes ricinus* and *Dermacentor marginatus*. I. Transmission from tick to tick.]—Vet. Čas. 8, 478-484. [In Czech. Summaries in English, French, German and Russian.] 1414
- It was established that the virus of Eastern equine encephalomyelitis was neither passed from one stage of infected engorged *Ixodes ricinus* and *Dermacentor marginatus* to the next developmental stage, nor was it transmitted transovarially or by copulation between infective female and non-infective male *I. ricinus*.—E.G.
- Ihlenburg, H. (1959). Beitrag zum klinischen Bild der Bornaschen Krankheit des Schafes. [The clinical picture of Borna disease in sheep.]—Mh. VetMed. 14, 503-506. 1415
- In Saxony in 7 of 80 cases the disease was characterized by repeated and sudden clonic convulsions. Between convulsions the sheep behaved almost normally. Three of the 7 sheep recovered spontaneously.—R.M.
- Scott, G. R. (1959). **Heat inactivation of rinderpest-infected bovine tissues.**—Nature, Lond. 184, Suppl. No. 25 pp. 1948-1949. 1416
- The half-life of 3 strains of rinderpest virus in lymph nodes, spleen and blood from infected cattle was 5 min. at 56°C. and 2.3 days at 7°. At 37° and 25° the half-life was 105 min. and 6.4 hours in lymph nodes and spleen, and 21 hours and 1.5 days in blood. At -15°C., in lymph nodes and spleen, a half-life of 72 days was found. It is concluded that rinderpest virus is not killed by present methods of storing and transporting beef. —M.G.G.
- Fournier, J. & Huard, M. (1959). Utilisation du "virus L" pour le chargement des boeufs producteurs de sérum anti- peste bovine. [Utilization of lapinized virus for the production of anti-rinderpest serum in cattle.]—Rev. Elev. 12, 21-26. [Summaries in English and Spanish.] 1417
- In Viet-Nam 1,900 litres of anti-rinderpest serum, prepared at the Institut



Pasteur de Nhattrang, were used during 1958 for treatment and also to counteract the severe febrile reaction caused by inoculation of Nakamura III virus vaccine. Oxen used for preparing the serum were hyperimmunized with the Nakamura III lapinized virus.—R.M.

Roderick, L. M. (1959). **Malignant catarrhal fever.** — Vet. Med. 54, 509-512 & 529-532. 1418

R. discussed the relevant literature and described bovine malignant catarrh as it occurs in Kansas and North Dakota. Although morbidity was low, mortality was high and half of one herd died within 5 months. Death occurred after 7-10 days' illness.—R.M.

Goto, M. (1959). [Pathological studies on so-called bovine influenza. I. Changes in the visceral organs. II. Changes in striated muscles and the central nervous system.]—Jap. J. vet. Sci. 21, 123-130; 153-160. [In Japanese. Abst. from English summaries.] 1419

For previous reports on "bovine influenza" in Japan see *V.B.* 25, 1009. Goto examined 37 cases and could find no evidence of elementary bodies characteristic of *Miyagawanella* infection and no similarities with Australian ephemeral fever. There were necrotic lesions in liver, spleen and kidney. Aspiration pneumonia was a frequent finding, probably the result of pharyngo-laryngeal paralysis which was a striking feature of the disease. Degenerative lesions of striated muscle were present and severe in all cases, particularly in the tongue, pharynx and oesophagus; the characteristic lameness and pharyngolaryngeal paralysis were probably caused by these lesions. In the brain the main changes were congestion and peri-vascular oedema; there was no evidence of encephalitis.—R.M.

Brown, A. L. & Bjornson, C. B. (1959). **The relationship of nasal discharge to infection with infectious bovine rhinotracheitis virus.** — Amer. J. vet. Res. 20, 985-988. [Authors' summary modified.] 1420

Steers inoculated either intranasally or intramuscularly with infectious bovine rhinotracheitis virus showed some or all of the clinical signs associated with the disease, including fever, nasal discharge, difficulty in breathing, anorexia, and weight loss. Four steers inoculated intranasally, and 5 of 7 inoculated intramuscularly, had typical copious nasal discharge. Swabs collected from the

nostrils of the steers during the first three days after the appearance of nasal discharge were examined for the virus, which was not demonstrable in the animals inoculated intramuscularly.

I. Stöber, M. (1959). Die klinische Seite der sogenannten "Mucosal-Disease" (Schleimhautkrankheit) des Rindes. [Clinical picture of mucosal disease.] — Dtsch. tierärztl. Wschr. 66, 582-586. 1421

II. Schulz, L. C. (1959). Pathologisch-anatomische Befunde bei der sogenannten "Mucosal-Disease" (Schleimhautkrankheit) des Rindes. [Pathology of mucosal disease.] — Ibid. 586-588. [Summaries in English.] 1422

I & II. Mucosal disease in North Germany was characterized by acute course and high mortality in young cattle (only 3 of 61 recovered) with erosions on the nose, mouth, tongue, and interdigital and intestinal lesions similar to those described in other countries. It was suggested that the erosive stomatitis observed in Westphalia 1952-55 [*V.B.* 26, 1378] might have been mucosal disease. Details of the outbreak reported by Voss [*V.B.* 29, 2454] were included in this report. There are 14 coloured illustrations of lesions.—R.M.

McCormack, P. E., St. George-Grumbauer, T. D. & Pulsford, M. F. (1959). **Mucosal type disease of cattle in South Australia.** — Aust. vet. J. 35, 482-488. [Authors' summary modified.] 1423

A disease of the mucosal disease-virus diarrhoea complex is reported in young cattle. Although there are no features in this disease not previously described within this complex, their combination does not agree with any previous descriptions.

The buccal erosions seen in the field cases have been reproduced in experimental calves by intravenous injection of blood. None of the experimental animals has become sick or shown any but the most transient diarrhoea.

Šetka, R. (1959). Chronický granulární zánět varlat u býků. [Chronic interstitial orchitis in bulls, possibly due to a virus.] — Veterinářství 9, 18-20. [In Czech.] 1424

Progressive disturbances in spermatogenesis, decrease in libido and orchitis were observed in bulls from three insemination centres. Semen and blood samples were negative for brucellosis and vibriosis. An infective agent, pathogenic for unweaned mice, was isolated and passaged in chick

embryos. Heads of some spermatozoa contained light-refractive inclusions. A number of cows inseminated from an infected bull developed colpitis, but smears were bacteriologically negative. Some of the bulls were castrated and histologically there was chronic interstitial orchitis with secondary fibrosis and necrotic foci. A suspension prepared from testicular tissue of an infected bull was instilled into the preputial sac of three bull calves, one of which developed after about one month a mild, bilateral orchitis.—E.G.

Komarov, A., Goldsmit, L., Kalmar, E., Adler, J. H. & Egyed, M. (1959). [**Isolation of a viral agent from winter dysentery of cattle.**] —Refuah vet. 16, 111-114. In Hebrew. [In English p. 152.] 1425

A virus isolated from the blood of cattle with winter dysentery has undergone 19 passages in embryonated eggs and 14 intracerebral passages in adult mice. Passaged virus reproduced the disease in cattle. Three passages of the disease were made in cattle by i/v inoculation of blood.—M.G.G.

Olson, C., Segre, D. & Skidmore, L. V. (1959). **Immunity to bovine cutaneous papillomatosis produced by vaccine homologous to the challenge agent.**—J. Amer. vet. med. Ass. 135, 499-502. [Authors' summary modified.] 1426

Formolized bovine tissue wart vaccine was more effective than formolized chick embryo vaccine in inducing resistance against challenge. However, the resistance was not complete to all strains of the wart virus even though relatively large doses of the vaccine were used.

Klein, M., Earley, E. & Zellat, J. (1959). **Isolation from cattle of a virus related to human adenovirus.** — Proc. Soc. exp. Biol., N.Y. 102, 1-4. [Authors' summary modified.] 1427

A virus isolated from faeces of an apparently normal cow was identified as an adenovirus related to or identical with an as yet unidentified type of human adenovirus.

Karpovich, L. G. & Levkovich, E. N. (1959). [**Differentiation of the viruses of louping-ill and tick-borne encephalitis in tissue cultures.**] —Voprosy Virusologii 4, 566-571. [In Russian. Summary in English.] 1428

Louping-ill virus had a cytopathic action on HeLa cells but the virus of tick-borne encephalitis had none.—R.M.

Wight, P. A. L. (1960). **The histopathology of the spinal cord in scrapie disease of sheep.** —J. comp. Path. 70, 70-83. [Author's conclusions modified.] 1429

Vacuolated neurones were absent or rare in the spinal cord of healthy sheep.

The most significant lesion in scrapie was vacuolation and degeneration of neurones. All animals affected with the natural disease show neuronal changes in the spinal cord. In the experimental disease lesions were seen in only 94% of animals.

Vacuolation of neurones in the natural cases was correlated with the severity of the clinical symptoms. Most commonly affected were the intercalated neurones and central neurones of the sympathetic system; motor neurones were relatively infrequently affected.

Intracytoplasmic phloxinophilic bodies were seen in both healthy and diseased sheep. However, in some of the natural scrapie cases, large phloxinophilic bodies were unusually numerous.

Increased satellitosis and massive neuronophagia were rare, but occasional degenerated cells showed evidence of neuronophagia. Secondary degeneration affecting both axis cylinders and myelin was found in the ventral and lateral funiculi. Usually few fibres were affected, and in only 2 cases was the degree of degeneration marked.

Parry, H. B. (1960). **Scrapie: a transmissible hereditary disease of sheep.**—Nature, Lond. 185, 441-443. 1430

Parry has had under observation for seven years some 70 flocks totalling about 10,000 breeding ewes. Many of the flocks are pedigreed and full records are available. Ten breeds are represented and the incidence of scrapie in the various flocks has varied. At one extreme some flocks have had no cases for as long as five years and are considered free, at the other there are a few flocks where the incidence has been over 20%.

During the seven years some 800 cases of scrapie have occurred of which 149 were available for post-mortem examination.

The age at which scrapie first became manifest varied from 1½ up to 11 years but about 90% of cases had become manifest by 4½ years.

The records suggest that spread of infection does not occur by contact, by coitus or from a contaminated environment; they also indicate a higher incidence in certain families.



Parry has examined the pedigree records and has, retrospectively, constructed tables of various types of mating such as; affected  $\times$  affected; affected  $\times$  unaffected carrier; unaffected  $\times$  unaffected and so on. He has then compared the observed number of cases of scrapie in the progeny with what would have been expected if scrapie was inherited as a simple autosomal recessive gene. The observed and expected incidences compare extremely closely.

For example in the affected  $\times$  affected group 24 female progeny were observed over 4½ years and 22 cases were recorded as against 21.6 "expected" on the basis that 90% of cases would become manifest over the 4½ years.

It is postulated that scrapie may be inherited as an autosomal recessive gene but that the manifestation of the genotype is mediated by an inoculable agent possibly chemical in nature.

The necessity for further studies is pointed out. These will have to be of a long-term nature and will of course be hampered by the difficulty of identifying either the homozygous affected animals or the heterozygous "carrier" ones because of the late age at which the disease may become manifest.

Darcel, C. le Q. & Avery, R. J. (1960).

**Potassium and hemoglobin types in sheep with special reference to the transmission of scrapie.**—*Canad. J. comp. Med.* **24**, 17-25. [Authors' summary modified.] 1431

The suggested familial occurrence of scrapie encouraged a study of two hereditary characters in sheep. Potassium and haemoglobin blood types have been determined in Cheviot and Suffolk sheep. The Cheviots were randomly bred and the Suffolks were accurately pedigreed and from a flock in which scrapie had been diagnosed.

The existence of two potassium types characterized by high (median value 33 milliequivalents per litre) and low (median value 12) levels of whole blood potassium were confirmed. The data were compatible with low potassium animals being homozygous recessives and high potassium being homozygotes or heterozygotes. The existence of three haemoglobin types was also confirmed.

Scrapie occurred in experimentally affected animals irrespective of potassium or haemoglobin type but the number of cases available was too small to reflect any possible effect on the susceptibility to the disease.

No changes in blood potassium level were noted in affected sheep with progress of the disease.

Žuffa, A., Liebenberger, J., Wagner, E. & Foltýn, F. (1959). Pokusy s vírusom moru ošípaných, adaptovaným na králiky. [Experiments with lapinized swine fever virus.]—*Vet. Čas.* **8**, 485-502. [In Slovak. Summaries in English, French, German and Russian.] 1432

Pigs developed immunity the fourth day after vaccination with lapinized swine fever virus. Older pigs tolerated the vaccine better than those up to four months of age. Virus excretion and subsequent immunization of non-vaccinated sty-mates was observed. The virus remained unchanged after ten swine passages. Undesirable post-vaccination effects were overcome by simultaneous injection of 20 ml. of immune serum. Viraemia was demonstrated between the 4th-12th day after vaccination in pigs immunized by the virus alone, but not in those injected simultaneously with serum. Leucopenia was not observed within three weeks after vaccination.—E.G.

Gotink, W. M. & van Ulsen, F. W. (1960). Inclusion-body rhinitis (IBR) bij biggen. [Inclusion-body rhinitis in piglets.]—*Tijdschr. Diergeneesk.* **85**, 23-28. [In Dutch. Summaries in English, French and German.] 1433

This is the first report of the occurrence of inclusion-body rhinitis in the Netherlands. It was diagnosed in 8 piglets aged 2-3 weeks from 6 farms. [See also *V.B.* **30**, 713.]—R.M.

Underdahl, N. R., Blore, I. C. & Young, G. A. (1959). **Edema disease of swine. I. A preliminary report on experimental transmission.**—*J. Amer. vet. med. Ass.* **135**, 615-617. 1434

An agent recovered from a disease-free pig that died, without clin. signs, after being placed in contact with pigs from a herd in which oedema disease had occurred, produced the clin. signs, oedema and haemorrhage characteristic of oedema disease of swine and underwent ten passages in week-old disease-free piglets. Test pigs were infected by intranasal-oral administration of diluted blood or lung tissue, and many died in 2 days (average 3 days). The agent did not pass Selas or Gradocol membrane filters, was not neutralized by immune sera against swine fever, erysipelas, and "Nebraska University disease" of pigs, and was inactivated by exposure to 50°C. for 15 min. It was not

infective for mice, but underwent 6 passages in embryonated eggs. Bacteriological examination of the eggs was negative. It is considered to be a virus.—M.G.G.

Brueckner, A. H., Taylor, H. L., Schroeder, J. P. & Koehler, A. (1959). **Development of a canine globulin concentrate.**—Proc. Soc. exp. Biol., N.Y. 102, 20-25. [Abst. from authors' summary.] 1435

A method is described for purifying and concentrating antibody globulins from serum of dogs hyperimmunized against canine distemper, canine virus hepatitis and *Leptospira canicola*.

Dickens, R. K. & Allen, G. G. (1959). **A note on the successful treatment of a case of feline infectious enteritis with cortisone.**—Aust. vet. J. 35, 495-497. [Authors' summary modified.] 1436

A case of hyper-acute feline infectious enteritis in a male Burmese cat is described. Treatment with cortisone and glucose saline, and subsequently by ACTH therapy, effected full recovery in a short period.

Scott, G. R. & Winmill, A. J. (1960). **Newcastle disease in the grey parrot (*Psittacus erithacus* L.).**—J. comp. Path. 70, 115-119. [Authors' conclusions modified.] 1437

Newcastle disease virus was isolated from clinically affected grey parrots. Despite the slow spread of the disease through the parrots at risk, the isolated virus was fully invasive and virulent for domestic fowls and was typed as mesogenic.

The virus agglutinated fowl, human and g.pig erythrocytes but not those of cattle, goats, hamsters and horses.

The haemagglutinin was a medium elutor and was heat labile, being inactivated after 10 min. at 56°C.

Shah, K. V. & Johnson, H. N. (1959). **Isolation of Ranikhet (Newcastle) virus from a fledgeling koel, *Eudynamis scolopaceus* s. (Linnaeus), by intracerebral inoculation in mice.**—Indian J. med. Res. 47, 604-608. 1438

The Indian koel habitually lays its eggs in the nests of crows. While studying reservoir hosts of arthropod-borne viruses, the authors isolated Newcastle disease virus from a fledgeling koel. Attempts to isolate the virus from fledgeling crows in the same nest as the koel failed.—R.M.

Galassi, D. & Gramenzi, F. (1959). **Caratteristiche specifiche di ceppo nei virus della**

pseudopeste aviare. Nota I: Prove di inibizione dell'emoagglutinazione e deviazione del complemento con antigeni V di ceppi velogeni e lentogeni. [**Specific characteristics of strains of Newcastle disease virus. I. Haemagglutination inhibition and complement fixation.**]—Vet. ital. 10, 968-983. [Summaries in English, French and German.] 1439

A highly pathogenic strain of virus isolated from an outbreak in Italy was distinguished from the attenuated Strain F with the aid of haemagglutination inhibition and c.f. tests.—R.M.

Magee, W. E. & Sagik, B. P. (1959). **Influence of infection by Newcastle disease virus on metabolic pathways in tissue culture.**—Arch. Biochem. 82, 340-347. 1440

The metabolism of chick fibroblasts in infected and uninfected cultures was studied with the aid of radioactive isotopes.—R.M.

Rosenwald, A. S., Hanson, R. P. & Brandly, C. A. (1959). **Studies on pathogenic Newcastle disease virus contaminants in Newcastle disease wing-web vaccines.**—Amer. J. vet. Res. 20, 946-953. 1441

In an attempt to develop methods of detecting pathogenic strains of Newcastle disease virus in wing-web vaccines, 2 such vaccines, alone or contaminated with a pathogenic strain, were injected i/v or i/m into chickens. Observation of the clin. reactions showed that the vaccinal strains interfered with multiplication of the pathogenic strain. It is concluded that this is not a satisfactory method of detecting viral contaminants. One of the vaccinal strains consistently induced immunity in in-contact birds, the other did not.—M.G.G.

Chute, H. L., O'Meara, D. C. & Witter, J. F. (1959). **Controlling infectious bronchitis in Maine chickens.**—Bull. Maine agric. Exp. Sta. No. 584. pp. 26. 1442

The incidence of infectious bronchitis in unvaccinated flocks in Maine is 85%. Symptoms are usually moderate and last about 1-3 weeks. Since 1945 chickens have been immunized with a living pathogenic strain of the virus by aerosol or intratracheally. In over 6 million birds mortality in the 3 weeks after immunization was less than 1%. A fall in egg production or hatchability has not occurred among hens immunized as chicks. All of 400 immunized 5 to 9-week-old chicks were immune 58 weeks later. Almost all chicks



from immune hens were themselves immune up to 7 days of age, 50% were immune at 14 days and 10% at 21 days.—M.G.G.

Pette, J. (1959). Zur Ausscheidung des Hühnerbronchitisvirus im Kloakeninhalt. [Excretion of the virus of avian infectious bronchitis in cloacal contents.] — Mh. Tierheilk. 11, 296-300. 1443

The virus was recovered from the cloacal contents of 35 fowls and 10 chicks between 3 and 24 days after experimental oral infection. —M.G.G.

Burke, C. N., Luginbuhl, R. E. & Jungherr, E. L. (1959). Avian enteric cytopathogenic viruses. I. Isolation. II. Characteristics of a prototype.—Avian Diseases 3, 412-419 & 419-427. [Authors' summaries modified.] 1444

I. Using tissue cultures of chick kidney cells, enteric viruses have been isolated from healthy as well as diseased chickens. Attempts to isolate them in chick embryos or in tissue cultures of calf or monkey cells were unsuccessful. Most of the isolations were from birds aged 17 weeks or younger. Pathogenicity tests in eggs using material adapted to tissue culture indicated that more than one group of agents had been isolated.

II. Hyperimmune serum was prepared in rabbits from one prototype avian enteric virus. Seven of 21 isolates from an apparently healthy flock of birds were neutralized by the hyperimmune serum.

Birds infected with one type of agent had previously yielded samples positive for an entirely different type of agent.

Duck kidney cells were susceptible to the prototype virus on first passage though no adaptation to calf or monkey cells was observed after three passages.

The prototype virus was pathogenic for newly-hatched chicks and for chick embryos, but not for unweaned mice. The agent was viable after incubation for 22 hours at 50°C. No haemagglutinins were found in infected materials from egg or cell cultures.

Plaques were formed when the agent was inoculated into cultures of chick kidney cells. Cross-neutralization was demonstrable between this agent and the virus of avian encephalomyelitis.

I. Bankowski, R. A. & Page, L. A. (1959). Studies of two epornitics of ornithosis caused by agents of low virulence.—Amer. J. vet. Res. 20, 935-940. 1445

II. Page, L. A. & Bankowski, R. A. (1959).

Investigation of a recent ornithosis epornitic in California turkeys. — Ibid. 941-945. [Authors' summaries modified.] 1446

I. Investigation of two epidemics of psittacosis in turkeys caused by agents of low virulence revealed the following:

Indirect complement-fixation (ICF) titres were found in approx. 8% of a sample of breeding birds tested two months after diagnosis. Antibodies persisted as long as 17 months after the natural infection, and a cutaneous hypersensitivity to Benedict's skin-test reagent was present for at least 18 months.

Experimentally-induced infectious sinusitis in convalescent turkeys, 6-8 months after diagnosis of psittacosis, did not alter ICF titres of the birds and did not appear to reactivate any potential latent disease.

Turkeys resisted re-infection and antigenic stimulation following 44,300 mouse l.d.<sub>50</sub> of the homologous strain given intratracheally 30 months after natural exposure. However, multiplication of the agent and a serological response were evident in mature, apparently normal controls and in turkeys previously exposed to the more virulent NJ-1 psittacosis agent.

All attempts to isolate an infectious agent or demonstrate positive serological reactions in 100 poults hatched from eggs collected during the peak of the psittacosis epidemic in the parent flock were unsuccessful.

II. A psittacosis agent was isolated from turkeys of a breeding flock in California.

Attempts to isolate the agent by mouse-passage tests from 262 embryos at different stages of incubation and from 13 day-old poults hatched from eggs collected during the acute phase of the disease in the parent flock were unsuccessful. In serological tests on the sera of 23-day embryos and day-old poults from the same flock about 10% showed indirect complement-fixation antibodies.

The source of infection was not established; however, an unidentified micro-organism causing lesions in mice indistinguishable from those of psittacosis was isolated from the organs of sparrows collected on the affected premises.

I. Giroud, P. (1959). Les zoonoses néo-rickettsiennes, leur épidémiologie. [Epidemiology of "neo-rickettsial" diseases.] — Maroc méd. 407, 563-569. 1447

II. Martin, L. A., Besiat, P., Chevrier, L. & Soubelet, B. (1959). Q fever et néo-rickett-

siose du bétail—Enquête sérologique. [**Q-fever and "neo-rickettsial" infections of animals in French Morocco: serological study.**] —Ibid. 575-576. 1448

I. Since 1954 there have been numerous references by French authors to diseases in cattle, sheep, dogs and human beings associated with agents referred to as "neo-rickettsia" which are probably viruses of the psittacosis-lymphogranuloma group. The diseases include pneumonia, abortion, encephalitis, and hepato-nephritis. At least seven strains of agent have been isolated. This article reviews the situation. [See also *V.B.* **27**, 481, 788, 3304-5; **28**, 1450-2, 3257; **29**, 3488; **30**, 414.]

II. Of 148 sera from indigenous cattle 44 gave positive micro-agglutination tests with antigen Q.18, prepared from an agent of the psittacosis-lymphogranuloma group isolated from a ewe that aborted; 7 gave positive reactions to Q fever antigen. Of 91 sera from sheep 19 were positive with antigen Q.18 and 19 with Q fever antigen.—T.E.G.R.

Boulanger, P. & Bannister, G. L. (1959). **Abortion produced experimentally in cattle with an agent of the psittacosis-lymphogranuloma-venereum group of viruses.** — *Canad. J. comp. Med.* **23**, 259-265. [Summary in French.] 1449

In the course of preparation of immune serum for use as control in the complement-fixation test for this group of viruses, an egg-adapted ovine abortion virus was inoculated into the udder of pregnant lactating cows through the teat canal. One cow exhibited severe self-limiting mastitis followed by abortion on the 75th day after inoculation. Two others similarly exposed developed infection as indicated by a high serological response in the blood serum but did not abort.

In cases of abortion in cattle where no specific causal agent can be demonstrated, it seems possible that with favourable conditions, migration to the uterus could take place from other organs such as the intestines or lungs where the psittacosis-lymphogranuloma group of agents are known to cause disease.

—R. V. L. WALKER.

Fiocre, B. (1959). Les crises de tachycardie paroxystique d'origine néo-rickettsienne. [**Paroxysmal tachycardia in cattle associated with "neo-rickettsia".**] — *Rec. Méd. vét.* **135**, 325-328. [Summaries in English and Spanish.] 1450

Crises of tachycardia, dyspnoea and colic were seen in two cows and two human beings (one being the author); a similar syndrome was seen in horses. Agglutinins against strains Q.18 (ovine) and V.14 (human) of psittacosis-lymphogranuloma agents were demonstrated in one cow and agglutinins against strain X.14 (human) in the human patients. Cattle in contact reacted to an i/d test with antigen "F 648" [no details given]. Dyspnoea was also seen in two new-born calves. The condition responded to spiramycin or tetracycline therapy.—M.G.G.

Iseli, R. (1959). **Anti-Virus-Therapie.** Ein Hochschulinstitut macht eine Umfrage und beantwortet die Frage der antiviralen Wirksamkeit des Virolitine in der tierärztlichen Praxis. [**Anti-viral action of Virolitine.**] — *Tierärztl. Umsch.* **14**, 271-274. 1451

From a study of clinical reports, the author attempted to assess the therapeutic activity of Virolitine, a proprietary preparation derived from cultures of *Candida albicans* and *C. parakrusei* [*V.B.* **26**, 148 & 794]. It appeared to be effective in bovine malignant catarrh, virus pneumonia of pigs, dog distemper, feline influenza, equine infectious anaemia and other conditions such as oedema disease of pigs. Further information was required on dosage and duration of action.—R.M.

I. Burnet, F. M. (1959). **Virus genetics.** — *Brit. med. Bull.* **15**, 177-180. 1452

II. Isaacs, A. & Burke, D. C. (1959). **Viral interference and interferon.** — Ibid. **185**-188. 1453

I & II. These two reviews are part of a whole issue of the *British Medical Bulletin* devoted to current virus research.—R.M.

Tjalma, R. A. & Braun, J. L. (1959). **Application of the Luoto capillary agglutination milk test to the study of bovine Q fever.** — *Amer. J. Publ. Hlth* **49**, 1025-1031. 1454

The authors applied the capillary-tube agglutination test described by Luoto [*V.B.* **27**, 1119] to the milk of cows.—R.M.

Grist, N. R. (1959). **The persistence of Q-fever infection in a dairy herd.**—*Vet. Rec.* **71**, 839-841. [Author's summary modified.] 1455

Cows in a self-contained herd infected with Q fever were examined at intervals over nearly 4 years. Not more than 15% of the lactating cows showed evidence of infection at any one time, but excretion of rickettsia in milk could persist for periods as long as 32



months. Loss of infectivity and c.f. antibody was observed, and it is suggested that infection is maintained within the herd largely by younger non-immune animals.

Bool, P. H. (1959). **Studies on *Ehrlichia canis* (syn. *Rickettsia canis*)**. — *Acta trop.*, Basel 16, 97-107. [Summaries in French and German.] 1456

Twelve dogs were infected s/c or i/v with *R. canis*. Two died, one 7 weeks later, the other 9 months later after splenectomy and 2 re-infections. All showed a sharp fall in haemoglobin and r.b.c. content of the blood, prolonged coagulation time and increased sedimentation rate, but no monocytes. The infection was produced in a dog by i/v inoculation of blood from a dog infected

experimentally 25 months previously. It was not produced by inoculation of blood and tissue from a puppy from an infected bitch. Lab. animals were not susceptible to *R. canis*, and it did not grow in fertilized hens' eggs incubated at 37°C.—M.G.G.

Michalka, J. (1959). **Infektiöse Keratoconjunctivitis — seuchenhaftes Erblinden der Gemse. [Infectious keratoconjunctivitis — epidemic blindness in chamois.]** — *Wien. tierärztl. Mschr.* 46, 650-663. 1457

An infectious keratoconjunctivitis of chamois, sometimes causing blindness, and first reported in 1915 is discussed. It is probably transmitted by contact, flies, salt licks and ticks. The causal agent, probably a rickettsia, has not been identified.—M.G.G.

See also absts. 1292 (differential diagnosis of streptococcal infections from mink distemper); 1663-1666 (reports, Nyasaland); 1667 (report, Uganda); 1668 (report, British Guiana); 1670 (report, California); 1672 (book, diseases of poultry).

## IMMUNITY

Coons, A. H. (1959). **I. Antibodies and antigens labelled with fluorescein. II. The diagnostic application of fluorescent antibodies.** — *Schweiz. Z. allg. Path.* 22, 693-699 & 700-723. [In English.] 1458

C. described the fluorescent-antibody technique and reviewed its applications.

—R.M.

Rowley, D. (1960). **The role of opsonins in non-specific immunity.** — *J. exp. Med.* 3, 137-144. [Author's summary modified.] 1459

A study of the recoveries of radioactivity, and of viable bacteria following injection of  $P^{32}$ -labelled *Escherichia coli* into the mouse peritoneum, has indicated that the rapid decrease in viable bacteria which occurs is largely due to peritoneal events and not to the transport of bacteria elsewhere.

It is suggested that the provocation of non-specific immunity by bacterial lipopolysaccharides involves two facets at least; first, an increase in the opsonic capacity of the serum, and secondly an increase in the inherent capacity of phagocytic cells to perform this function.

Brumfield, H. P. & Pomeroy, B. S. (1959). **Test based on normal serum component implementing fixation of complement by turkey antiserum.** — *Proc. Soc. exp. Biol., N.Y.* 102, 278-280. [Authors' summary modified.] 1460

A factor in normal fowl serum when added to heated or unheated immune turkey serum-antigen complexes caused fixation of

g.pig complement. The factor was labile at 56°, unstable at room or refrigerator temperatures but remained active for several weeks at -20°C. It was found in the water-insoluble fraction of serum and could be removed from diluted serum on kaolin.

Goldgraber, M. B. & Kirsner, J. B. (1959). **The Shwartzman phenomenon in the colon of rabbits. A serial histological study.** — *Arch. Path.* 68, 539-552. [Authors' summary modified.] 1461

The local Shwartzman phenomenon was studied in the colon of rabbits in which a solution of *Serratia marcescens* (*Chromobacterium prodigiosum*) lysate had been given into the intestine through a transperitoneal approach and the same lysate had then been injected 24 hours later intravenously. The colon responded with a violent local reaction, characterized grossly by hyperaemia and haemorrhage, and microscopically by haemorrhage, thrombosis, and, later, granuloma formation.

Sokol, A. (1957/58). **Hypo- a agamaglobulinémie u hospodárskych zvierat. [Low gamma globulin content in the blood of farm animals.]** — *Folia vet., Košice* 2, 73-94. [In Slovak. Summaries in English, German and Russian.] 1462

Microelectrophoresis revealed abnormally low gamma globulin content in blood samples of 7 of 107 foals aged up to 15 days, in 39 of 287 calves aged up to 6 months, and in 42

of 312 pigs up to one year old. Maternal gamma globulin is supplied to new-born animals with the colostrum, whereas in human beings this transfer takes place during intra-uterine life. Low gamma globulin content in young farm animals was associated with the occasionally encountered failure of vaccines to protect young animals.—E.G.

Anderson, J. W. (1959). **The placental barrier to gamma-globulins in the rat.** — Amer. J. Anat. 104, 403-429. [Author's summary modified.] 1463

In an effort to locate the placental barrier

to proteins in the rat, gamma-globulins were isolated from female rats by the low temperature-ethanol method, labelled with  $I^{131}$ , and injected into rats after 11, 15 and 17 days of pregnancy. Histological relations were determined by autoradiographs of sections of entire gestation sacs removed within two hours after injection of the gamma globulins.

Autoradiographs showed that the globulins probably encountered a barrier at the trophoblast. They entered the visceral entodermal epithelial cells in small amounts, and probably were for the most part retained (or metabolized) in the apices of these cells.

See also absts. 1288 (unresponsiveness in rabbits to staphylococcal toxoid); 1293 (detection of specific antibody to Group A streptococci); 1303 (skin sensitivity to tuberculin in cattle vaccinated against John's disease); 1307 (swine erysipelas vaccines); 1310 (resistance and vaccination in sheep to listeriosis); 1312 (haemorrhagic septicaemia vaccines); 1315 (fowl cholera); 1339-1344 (brucellosis); 1353 (tetanus); 1363 (combined live vaccine against plague tularemia, brucellosis and anthrax); 1379 (trypanosomiasis); 1385-1387 (toxoplasmosis); 1390-1395 (F. & M. disease); 1397-1398 (rabies); 1402 (fowl pox); 1408 (interferon); 1416-1417 (rinderpest); 1426 (papillomatosis); 1432 (swine fever); 1439-1441 (Newcastle disease); 1490 (production in dogs against hookworm).

## PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Moore, B., Drummond, R. O. & Brundrett, H. M. (1959). **Tests of insecticides for the control of goat lice in 1957 and 1958.** — J. econ. Ent. 52, 980-981. [Authors' abst. modified.] 1464

To investigate resistance of biting lice (*Bovicola caprae* and *B. limbatus*) to chlorinated hydrocarbon insecticides, goats were dipped in insecticides at recommended dosages. Lice from one ranch were not killed by 0.25% toxaphene, which previously had been very effective. Field tests were conducted with sprays of Delnav (2, 3-para-dioxanedi-thiol S, S-bis (O, O-diethyl phosphorodithioate)), ronnel, malathion, Dipterex, Bayer 21/199, Sevin (1-naphthyl N-methyl carbamate), and toxaphene for the control of biting lice and sucking lice (*Linognathus stenopsis*). Toxaphene and 0.1% Delnav failed to kill lice. Others were effective within 24 hours on goats with fleece shorter than 10 weeks' growth, and from 3 to 5 days on goats with longer fleece. Flocks sprayed with 0.5% ronnel, 0.1% Bayer 21/199, and 0.5% Sevin were free from lice at the next shearing (2 to 4 months).

Browne, L. B. & Rogoff, W. M. (1959). **The "sheep factor" and oviposition in *Lucilia cuprina*.** — Aust. J. Sci. 21, 189-190. 1465

Earlier workers [V.B. 6, p. 140; 16, 2277] have reported that *Lucilia sericata* and *L. cuprina* lay eggs more readily near putrefying materials on living sheep than near similar materials on clipped fleeces or on pelts of sheep. A "sheep" or "S" factor was postulated to explain these results. Browne &

Rogoff demonstrate that this concept is false because earlier results were due to artefacts in the preparations used.—M. D. MURRAY.

Khan, M. A., Thompson, C. O. M. & Pelham, W. L. (1959). **Co-Ral sprays for systemic control of the cattle grubs *Hypoderma bovis* L. and *H. lineatum* De Vill.** — Canad. J. Anim. Sci. 39, 115-120. 1466

Aqueous suspensions of Co-Ral (Bayer 21/199) incorporated in a wettable powder were sprayed on calves in winter for the control of migrating hypoderma larvae. Sprays were used with anionic surface active agents or a combination of anionic and non-ionic surface active agents. Sprays containing 0.75% of Co-Ral reduced the number of larvae reaching the backs of treated calves by nearly 90% compared with controls. With higher (0.25 and 0.5%) dilutions of Co-Ral larval mortality was lower. Neither the surface active agents nor the spray pressure employed had any effect on the larvicidal properties. A 4% Co-Ral ointment (lanolin and soya bean oil base), applied in one group to the sides of the neck, had no systemic effect on the larvae.—R. V. L. WALKER.

Kenny, J. E. & Thornberry, H. (1959). **"Trolene" (DOW ET-57) trials, 1958-1959.** — Irish vet. J. 13, 176-180. 1467

53 cattle were drenched once (November), 58 twice (November, December) and 55 three times (November, December, January) with ronnel (Trolene) at the rate of 5 g./100 lb. body weight (=110 mg. pure



Dow ET-57 per kg.); these and 166 untreated cattle were distributed over 7 farms. Warble examinations were made monthly between March and July; 3,086 warbles developed in the control and 245 in the treated group, a percentage reduction of 92. 184 (75%) of the warbles in the treated cattle were in those dosed once, 57 (23%) in those dosed twice and 4(2%) in those dosed three times. No toxic effects were observed. [See also *V.B.* **29**, 1813.]—W. N. BEESLEY.

Knapp, F. W., Brethour, J. R., Harvey, T. L. & Roan, C. C. (1959). **Field observations of increasing resistance of cattle to cattle grubs.**—*J. econ. Ent.* **52**, 1022-1023. 1468

41 calves which had warbles in the back were dosed with Trolene (Dow ET-57) and 45 left as controls; average numbers of warbles developing were 3.5 and 21.4 respectively. None of these calves were treated in the next season but the average warble counts were 0.9 and 3.3 per head respectively.

In another experiment 28 calves were sprayed with Dowco-109, 28 dosed by mouth and 26 left as controls; all calves had warbles in the back. The final average number of warbles per head was 3.8, 1.8 and 41.4 respectively. A year later, with no treatment, the number of warbles developing was 12.8, 9.3 and 16.4 per head respectively.

The authors claim that these data indicate increased resistance to warble infestation where warble larvae have been killed inside the host by insecticide.—W. N. BEESLEY.

Drummond, R. O. & Moore, B. (1959). **Ronnel sprays for systemic control of cattle grubs.**—*J. econ. Ent.* **52**, 1028-1029. 1469

4 cattle sprayed once (Nov.) with 2.5% purified ronnel (Trolene grade of Dow ET-57), 1.5 gal. per head at 100 lb./sq. in. pressure, remained free from warbles, while 20 untreated controls averaged 36.3 warbles each. 29 cattle sprayed once with 1.75% crude ronnel (Korlan grade), 1 gal. per head at 250 lb. pressure, showed only 63% warble reduction compared with 38 controls.

Cattle in another herd were sprayed four times with 0.25, 0.5 or 0.75% crude ronnel (Korlan), 1 gal. per head, 250 lb. pressure. The 0.75% spray gave complete control; the other concentrations were unsatisfactory.

—W. N. BEESLEY.

Beesley, W. N. (1960). **Field trials with Trolene (Dow ET-57, Ronnel, Etrolene) against war-**

**ble fly grubs in cattle.**—*Vet. Rec.* **72**, 21-23. 1470

Results are tabulated of 2 years' trials with Trolene, given in a single dose of 110 mg./kg. body wt. to 391 young cattle between September and February. Results were not consistently satisfactory; warble control ranged from 100% to 48%. Little difference in result was noted between times of treatment.—M.G.G.

Rosenberger, G. (1959). Sprühbehandlung mit systemisch wirksamen Mitteln zur Dasselbekämpfung. [Spray treatment of warble infestation with "Neguvon" and "Asuntol".]—*Dtsch. tierärztl. Wschr.* **66**, 549-554. [Summary in English.] 1471

A single treatment of 534 cattle with 2% "Neguvon" [Dipterex], sprayed at a pressure of 5-10 atmospheres at the beginning of December or February, reduced the number of warbles in the following spring by 96%, in comparison with untreated cattle. This result was as good as that achieved by 3 oral doses of 60-80 mg./kg. at monthly intervals, beginning in the first week of December. A single spray or wash with 0.5-1% "Asuntol" [Bayer 21/199, Co-Ral] in 1,148 cattle reduced warbles by only 35-85%. Three cattle sprayed at the beginning of February developed paralysis when larvae died in the spinal canal.—M.G.G.

Andersen, E. H. (1960). **Biology, distribution and control of *Dermatobia hominis*.**—*Vet. Med.* **55**, 72-78. 1472

A review. This fly occurs between 1,000 and 5,000 feet above sea level in the tropical zone of South America, and is favoured by the presence of cattle (its natural host), insects to act as egg vectors, a short dry season, and humid soil. [See also *V.B.* **24**, 3828, 3829; **25**, 422; and **28**, 1802.]—M.G.G.

Hidiroglou, M. & Prevost, R. (1959). Essais de lutte contre les Tabanidés en Guyane Française. [Tabanid flies on cattle in French Guiana and their control.]—*Rec. Méd. vét.* **135**, 635-650. [Summaries in English and Spanish.] 1473

28 species of tabanids; mostly *Tabanus*, were studied in the Savannah area of French Guiana. The flies attack mainly cattle, leading to loss of condition and anaemia.

Indoors, good control was effected by butoxypropylene glycol, a mixture of pyrethrins with piperonyl butoxide, or by aerosols containing BHC, pyrethrins, ethyl

benzoate, etc. Cattle sprayed with synergised pyrethrins (1.7 litres a head of a solution containing 12.5 ml. pyrethrins a litre) resisted fly attack for at least 2 days; butoxypropylene glycol in petrol was also a useful repellent.

—W. N. BEESLEY.

Tien-Hsi Cheng, Frear, D. E. H. & Enos, H. F., Jr. (1959). **Effectiveness of aerosol formulations containing methoxychlor and other insecticide-repellents against biting flies on cattle, and analyses of milk from treated animals.**—J. econ. Ent. 52, 866-868. 1474

Lactating cows were self-treated daily in an electric-eye device with aerosols containing 1, 2 or 4% methoxychlor in various combinations with pyrethrins, synergists, N, N-diethyl-m-toluamide, "Thanite" (82% isobornyl thiocyanacetate) and MGK-series repellents. Approx. 7 ml. of the mixture was discharged on each cow, in about 1.5 sec. Control of *Siphona irritans* (horn fly) was excellent (93-99%) for at least 14 weeks, but poor (31-61%) against *Stomoxys calcitrans*. Milk samples were taken 1-2 times weekly and did not contain any methoxychlor.

—W. N. BEESLEY.

Peterson, D. G. & Kingscote, A. A. (1959). **Control of animal parasites with systemic insecticides.**—Canad. J. Biochem. Physiol. 37, 1105-1112. 1475

Parasite control by the use of systemic parasitocides administered orally or parenterally was discussed, with particular reference to screw-worms and warbles. Phenothiazine and pyrethrins and chlorinated hydrocarbon insecticides were dealt with briefly and the newer organophosphorus compounds in more detail. 65 references are listed.

—R. V. L. WALKER.

Smythe, E. B. (1959). **The use of D.D.T. superphosphate topdressing in the control of the cattle tick (*Haemaphysalis bispinosa*).**—N.Z. vet. J. 7, 66. 1476

Locally high tick populations were reduced by aerial dressing with 2 cwt. of superphosphate containing 20 lb. pp/ D.D.T. per ton. All stock had been removed. Tick numbers began to fall 2 weeks later and were negligible after 4 weeks. Very few ticks were found on sheep used in restocking the area. S. considers it important to top-dress when the first nymphs appear and to restock only when sufficient rain has fallen to leach away parasiticide from the herbage.

—W. N. BEESLEY.

Wood, J. C., Sparrow, W. B., Page, K. W. & Brown, P. R. M. (1960). **The use of dieldrin, aldrin and Delnav for the control of the sheep tick, *Ixodes ricinus*.**—Vet. Rec. 72, 98-101. [Authors' summary modified.] 1477

Aldrin up to a concentration of 0.3% and dieldrin up to 0.58% in dips failed to control *Ixodes ricinus* on sheep.

A dip containing 0.1% Delnav (2, 3-dioxane-(*S-S*-bis-*O*, *O*-diethyl dithiophosphate)) gave good control of ticks for 5 to 6 weeks compared with 2 to 3 weeks' comparable protection following dipping in 0.1% gamma BHC.

van Rensburg, S. J. (1959). **Haematological investigations into the rhipicephaline tick toxicosis syndrome.**—J. S. Afr. vet. med. Ass. 30, 75-95. 1478

A group of cattle which had survived heavy infestation and a group which had been lightly infested with *R. appendiculatus* were subjected to heavy infestation. In the first group only a slight decrease in r.b.c. occurred. In the second group there was acute, transient, macrocytic, hypochromic anaemia which, after some months, reverted to mild, chronic normocytic, normochromic anaemia. These changes and the relationship between anaemia, concurrent diseases and degree of tick infestation are discussed. Field observations on tick toxicosis and histopathological findings are recorded.—T.E.G.R.

Curtis, L. C. (1959). **Control of the Rocky Mountain wood tick, *Dermacentor andersoni* Stiles (Acarina: Ixodidae), with ground sprays of dieldrin and heptachlor.**—Proc. ent. Soc. B.C. 56, 13-15. 1479

Dieldrin and heptachlor were sprayed on separate artificially infested rangeland plots at the rate of 0.5 or 1 lb./acre (30 gal. spray per acre). Counts of live ticks were made with a modified blanket drag technique. After 16 days ticks were reduced by 98% in both sets of high treatment plots and by 86-91% in the low treatment plots.—W. N. BEESLEY.

McCollister, D. D., Oyen, F. & Rowe, V. K. (1959). **Toxicological studies of O, O-dimethyl-O-(2,4,5-trichlorophenyl) phosphorothioate (ronnel) in laboratory animals.**—J. agric. Food Chem. 7, 689-693. 1480

No effect on health nor P.M. changes were noted in rats fed 15 mg. of this compound per kg. body wt. daily for 2 years, nor in dogs fed 10 or 25 mg./kg. daily for a year. —M.G.G.



Carpenter, C. P., Weil, C. S., Palm, P. E., Woodside, M. D. & Smyth, H. F., Jr. (1959). **The toxicology of butoxypolypropylene glycol 800 (Crag fly repellent).**—J. agric. Food Chem. 7, 763-769. 1481

This compound, when injected s/c or i/p into rats, passed tissue barriers poorly, and was of little or no hazard by the usual routes of entry to the body. It was not stored in the body. Rats tolerated 640 p.p.m. in the food for 2 years and dogs 890 p.p.m. for one year. —M.G.G.

Gannon, N., Link, R. P. & Decker, G. C. (1959). **Storage of dieldrin in tissues and its excretion in milk of dairy cows fed dieldrin in their diets.**—J. agric. Food Chem. 7, 824-826. [Authors' summary modified.] 1482

Dieldrin, at 0.1, 0.25, 0.75 and 2.25 p.p.m. in the diet of cows, appeared in the milk after 6-12 weeks in concentrations of 0.02, 0.06, 0.11 and 0.28 p.p.m. respectively. It was detected in the body fat at concentrations varying from 0.24 p.p.m. in cows fed the lowest dose to 5.48 in those fed the highest. Amounts found in other tissues were in proportion to their fat content.

Gannon, N., Link, R. P. & Decker, G. C. (1959). **Storage of dieldrin in tissues of steers, hogs, lambs, and poultry fed dieldrin in their diets.**—J. agric. Food Chem. 7, 826-828. [Authors' summary modified.] 1483

Dieldrin was detected in the fat of animals and fowls fed 0.1-2.25 p.p.m. in the diet for 12 weeks. Residues in other tissues

were in relation to their fat content. Laying hens accumulated more dieldrin than other species, but the eggs contained very little.

Gannon, N., Link, R. P. & Decker, G. C. (1959). **Insecticide residues in the milk of dairy cows fed insecticides in their daily ration.**—J. agric. Food Chem. 7, 829-832. 1484

In 18 cows fed a parasiticide for 16 weeks, aldrin (excreted as dieldrin) had the greatest tendency to appear in the milk and to be stored in the body fat, followed by dieldrin, DDT, heptachlor and methoxychlor. Methoxychlor had very little tendency to accumulate in the fat and to appear in the milk.—M.G.G.

Gyriscio, G. G., Norton, L. B., Trimberger, G. W., Holland, R. F., McEnery, P. J. & Muka, A. A. (1959). **Effects of feeding low levels of insecticide residues on hay to dairy cattle on flavor and residues in milk.**—J. agric. Food Chem. 7, 707-711. [Authors' summary modified.] 1485

Hay containing up to 10 p.p.m. of aldrin, lindane, DDT, parathion or methoxychlor was fed to cows for up to 3 months. Parathion and methoxychlor were not found in the milk. About 0.05 p.p.m. of lindane was detected. Small amounts of DDT and aldrin were found when cows were fed 10 p.p.m. for a month. At 2 to 4 p.p.m., no aldrin was demonstrable and no effect on health nor P.M. changes were noted. No effect on flavour of the milk was detected.

See also absts. 1345 (ticks as possible vectors of *L. pomona*); 1403-1406 (tick-borne encephalitis); 1409-1411 (Japanese encephalitis); 1412 (mosquitoes as vectors of Eastern equine encephalomyelitis); 1662 (report C.S.I.R.O., Australia); 1670 (report, California).

## PARASITES IN RELATION TO DISEASE [HELMINTHS]

Gordon, H. McL., Pearson, I. G., Thomson, B. J. & Boray, J. C. (1959). **Copper pentachlorophenate as a molluscicide for the control of fascioliasis.**—Aust. vet. J. 35, 465-473. [Authors' summary modified.] 1486

The efficacy of copper pentachlorophenate [CP] as a molluscicide against *Simulimnea subaquatilis*, the intermediate host in Australia of *Fasciola hepatica*, was demonstrated in field trials. CP was clearly superior to copper sulphate and killed both snails and their embryos in egg masses. Few or no live snails were found for several months after the application of CP to heavily infested areas.

The best formulation of CP was a 30% w/v dispersible paste. It was applied at 10 lb. active ingredient per acre in 400 gal. water by

means of a spray. The types of equipment used are illustrated.

Preliminary preparation of the snail infested areas was essential for ease of application and for highest efficiency. Spraying should be carried out before the end of winter when there is plenty of water in the habitats.

Meyling, A. H., Meyling, J., Schutte, C. H. J. & Pitchford, R. J. (1959). **Some observations on the effectiveness and stability of sodium pentachlorophenate when used as a molluscicide.**—Trans. R. Soc. trop. Med. Hyg. 53, 475-481. [Authors' summary modified.] 1487

Numerous laboratory and field experiments designed to evaluate the efficiency of pentachlorophenate as a molluscicide are

described. The results were not encouraging and it was felt that there would be little scope for its use in the Transvaal.

Graber, M. (1959). Action ténifuge chez l'homme et chez les mammifères domestiques de quelques dérivés de l'acridine. [**Acridine derivatives against tapeworms of man and domestic animals.**]—Cah. Méd. vét. 28, 181-195. 1488

Mepacrine hydrochloride, at a dose of 100 mg./kg., rid sheep of all *Moniezia expansa* and *M. benedeni*, but was ineffective against *Avitellina centripunctata* and *Stilesia globipunctata*. Acriflavine at 200 mg./kg. eliminated *M. expansa*, but is not recommended for sheep on account of its toxicity. The literature on anthelmintic action, dosage and toxicity of aminoacriquine and mepacrine hydrochloride was reviewed.—M.G.G.

Thienpont, D., De Keyser, J., Vandervelden, M. & Kageruka, P. (1959). La cysticerose cérébrale du porc. [**Cysticercus in the brain of slaughter pigs.**]—Ann. Soc. belge Méd. trop. 39, 507-514. [In French. Summaries in English, German, Spanish and Flemish.] 1489

In Ruanda-Urundi the incidence of *Cysticercus cellulosae* in pigs is about 20%. Of 100 pigs with cysticerci in the muscles, 68 had them in the brain also, the number varying from 1 to 86. They were examined histologically. No symptoms were observed before slaughter.—M.G.G.

Dow, C., Jarrett, W. F. H., Jennings, F. W., McIntyre, W. I. M. & Mulligan, W. (1959). **The production of active immunity against the canine hookworm *Uncinaria stenocephala*.**—J. Amer. vet. med. Ass. 135, 407-411. 1490

30 pups free from hookworms were divided into three groups of 12, 12 and 6 respectively. In the first group each pup received 1,000 hookworm larvae which had been X-irradiated with 40,000r, in the second 1,000 normal larvae whilst the third group were controls. In the first group 6 pups died of distemper between 14 and 20 days after receiving the larvae and at P.M. examination harboured on average 130 hookworms. In the second group 11 pups died of distemper and these harboured on average 746 hookworms demonstrating that fewer of the irradiated larvae reached maturity. The six survivors of group 1, the single survivor of group 2 and all in group 3 were challenged at 128 days with 1,000 normal hookworm larvae and when

killed at 150 days the pups harboured on average 32 worms in group 1; 530 in controls; while the group 2 survivor had 530. This appears to demonstrate a superior resistance resulting from infection with irradiated larvae compared with infection with normal larvae but the figure for group 2 was from the one animal only. The gross intestinal lesions in the animals receiving normal larvae consisted of punctiform haemorrhages. Similar but fewer changes were seen in the "vaccinated" pups challenged on the 128th day and killed on the 150th day. Microscopically the pups given normal larvae showed vascular lesions and necrotic changes in the intestine. The challenged groups, however, had reactive rather than necrotic lesions. A number of focal granulomata may have been reactions to inhibited hookworm larvae.—T. E. GIBSON.

Gibson, T. E. (1959). **Controlled tests with bephenium hydroxynaphthoate as an anthelmintic against *Nematodirus battus* in sheep.**—Vet. Rec. 71, 949-950. [Author's summary.] 1491

A small controlled test using 12 lambs artificially infected with *N. battus* showed bephenium embonate to be virtually 100% efficient against both the parasite larval forms and the mature worms of that species.

Michel, J. F. & Cornwell, R. I. (1959). **The complement fixation test as a measure of resistance to *Dictyocaulus* infection.**—Vet. Rec. 71, 912-913. [Authors' summary modified.] 1492

Ten pairs of calves were used to compare the level of acquired resistance to re-infection with *D. viviparus* and levels of complement fixing antibody in the blood as determined by means of a heated whole-worm antigen. Antibody titres required considerably longer to develop than did resistance to re-infection and no correlation between the two measurements was demonstrable.

Rose, J. H. (1960). **The field-slug *Agriolimax reticulatus* as a vector of the lungworm *Cystocaulus ocreatus*.**—Nature, Lond. 185, 180. 1493

*A. reticulatus* was the only species of mollusc infected with *C. ocreatus* on pasture where lungworm-free lambs became infested after grazing with infested ewes. First-stage larvae of *C. ocreatus* were recovered from lambs fed the feet of artificially infected *A. reticulatus*. This slug, the commonest and



most ubiquitous mollusc in Great Britain, is probably an important vector of *C. ocreatus*.

—M.G.G.

Hiepe, T., Heide, D. & Lippmann, R. (1959). Erfahrungen mit Cyanessigsäurehydrazid (CESH) in der Bekämpfung des Lungenwurmbefalls beim Schaf. [*Cyanacethydrazide in the control of lungworms in sheep.*]—Berl. Münch. tierärztl. Wschr. 72, 315-319. [Summary in English.] 1494

The toxicity and efficacy of "Benecid", a preparation of cyanacethydrazide, were tested. It was administered s/c at 15 mg./kg. body wt. to 1,586 sheep in 4 flocks. Efficacy was controlled by examination of faeces for larvae before and after treatment, by clinical examination and by the extent of lung lesions. Good results were obtained, particularly in sheep treated in spring before being turned out.—R.M.

Kelley, G. W., Jr., Sumption, L., Adams, J. & Olsen, L. B. (1959). Treatment of dams to reduce *Ascaris suum* infections in baby pigs.—*Vet. Med.* 54, 573-576. [Authors' summary modified.] 1495

Feeding of hygromycin B to sows during gestation lowered the output of ascaris eggs from 610 per g. of faeces in the untreated sows to 3 per g. in those treated. Treating the dams and farrowing in "clean" pastures did not substantially reduce the number of infected pigs. 48 of the 50 pigs from untreated dams had positive egg counts and 43 of 54 pigs from treated mothers were positive. All 19 pigs examined at necropsy were infected with ascaris regardless of the treatment of their dams. Treatment of the dams had no effect on daily gain or feed efficiency.

Dixon, J. M., Johnson, W. A. & Towers, B. A. (1959). Low-level feeding of hygromycin B and phenothiazine NF for the control of *Ascaridia galli* and *Heterakis gallinae* in broilers.—*Poult. Sci.* 38, 1199. 1496

Four groups of chicks were brooded in a house known to be infested with *A. galli* and *H. gallinae*. They received in the food either 7.2 g. hygromycin B per ton, 0.05% phenothiazine or 0.05% phenothiazine plus 7.2 g. hygromycin per ton. A fourth group received no treatment.

Phenothiazine alone reduced the numbers of both parasites but further reductions were effected by the hygromycin or the combination of the two drugs. The combination was of

special value because the parasite burden was reduced and the eggs laid by surviving parasites had reduced viability.—L. P. JOYNER.

Knapp, S. E., Folse, D. S., Moser, H. C. & McFarland, R. H. (1959). Comparative uptake of phenothiazine by *Ascaridia galli* and *Heterakis gallinae* in vitro.—*Vet. Med.* 54, 536-538. 1497

Adult worms of each species were placed in a suspension of phenothiazine labelled with radiosulphur. Uptake of radiosulphur by the worms was measured at intervals between  $\frac{1}{2}$  and 24 hours after exposure. Uptake per unit of body wt. was seven times greater in *H. gallinae* than in *A. galli*. This may explain why phenothiazine is relatively ineffective against *A. galli*.—R.M.

Shoho, C. (1959). Sur les filaires chez les équidés et les bovidés. [*Filariae in horses and cattle.*]—*Rev. Elev.* 12, 43-52. [Summaries in English and Spanish.] 1498

The author suggested that *Setaria digitata* and *S. labiato-papillosa* were the same species. Specimens from Japan, Ceylon, France and Spain were compared.—R.M.

Taguchi, M., Takehara, B. & Uriu, I. (1959). [Aberrant *Dirofilaria immitis* in the lateral ventricles of the brain in a dog.]—*J. Jap. vet. med. Ass.* 12, 430-432. [In Japanese. English summary modified.] 1499

Adult *D. immitis* were found in the lateral ventricles of the brain of a dog suspected of rabies. The dog showed slight posterior paralysis a few days before death.

The heart harboured about 40 *D. immitis* in the right atrium. In the brain, a small haemorrhage was found on the surface of the left piriform lobe, through which the nematode may have entered the lateral ventricles. There was a large haemorrhagic focus near the site of invasion. Glial-cell proliferation and perivascular cell infiltration were found around the tissues destroyed by the nematode. No infiltration of eosinophile cells was observed.

Logachev, E. D. & Bruskin, B. R. (1959). [Histological changes in the intestine of domestic ducks infested with *Polymorphus magnus*.]—*C. R. Acad. Sci. URSS* 129, 709-711. [In Russian.] 1500

Even severe infestation with this acanthocephalid was not accompanied by visible damage to the wall of the intestine. The head of each worm was surrounded by a thin

capsule of connective tissue. There was little or no inflammatory reaction at the site of attachment.—R.M.

Clarkson, M. J. & Owen, L. N. (1959). **The parasites of domestic animals in the Bahama Islands.**—Ann. trop. Med. Parasit. 53, 341-346. [Authors' summary modified.] 1501

The results are reported of a survey of the parasites of horses, cattle, sheep, goats, pigs, dogs and cats in the Bahama Islands.

The most important pathogenic parasites are the nodular worm and the trichostrongyles in goats and sheep and the heartworm in dogs.

It is believed that better methods of animal husbandry, routine use of anthelmintics, the planting of Pangola grass and *Leucaena glauca*, and the introduction of good-quality rams should double the present weight of sheep sent for slaughter.

Swierstra, D., Jansen, J., Jr. & van den Broek, E. (1959). **Parasites of zoo-animals in the**

**Netherlands. Survey of parasites of zoo-animals and animals not endemic in the Netherlands, identified from 1948 to 1958 inclusive.**

—Tijdschr. Diergeneesk. 84, 1301-1305. [In English. Summary in Dutch.] 1502

A list of hosts and their helminth parasites.—R.M.

Nanobashvili, V. I. (1959). [**Residual arsenic in animals treated with tin arsenate as anthelmintic.**]—Veterinariya, Moscow 36, No. 10 pp. 56-57. [In Russian.] 1503

Arsenic was present in trace amounts in muscle for up to 5 days in calves given 0.3-0.4 g. tin arsenate, for up to 7 days in ducks given 0.17-2 g., but for only 3 days in fowls given 0.15 g. Arsenic was present in the milk of ewes dosed with 0.7-1 g. but it was safe to use the milk for making butter. None was detected in eggs of fowls, ducks or geese.—R.M.

See also abst. 1662 (report C.S.I.R.O., Australia).

## SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

I. Pallaske, G. (1959). Über Zungenkarzinome beim Pferd. [**Carcinoma of the tongue in two horses.**]—Tierärztl. Umsch. 14, 348-351. 1504

II. Böhm, H. (1959). Schilddrüsenkrebs bei einem Pferd. [**Thyroid cancer in a horse.**]—Ibid. 351-353. 1505

I. The neoplasms were found in a Thoroughbred stallion aged 12 years and in a gelding aged 14 years. The local lymph nodes were involved but there was no distant metastasis.

II. Squamous-cell carcinoma was found in the left thyroid gland of a gelding aged 10 years. The horse was slaughtered because the tumour interfered with breathing.—R.M.

Clarkson, T. B., Netsky, M. G. & de la Torre, E. (1959). **Chromophobe adenoma in a dog: angiographic and anatomic study.**—J. Neuropath. 18, 559-562. 1506

A male Boxer aged 9 years developed greatly reduced appetite, lost weight, failed to recognize its owner, and was in a state of confusion. Cerebral angiography revealed lateral displacement of the internal carotid artery. When the dog was killed a large chromophobe adenoma of the pituitary gland, with extension into the third ventricle, was found.—R.M.

Kronberger, H. (1959). Zwei Fälle von Karzinomen des Harnapparates des Hundes mit Lungenmetastasen und Akropachie. [**Carcinoma of the urinary system with lung metastases and acropachy in two dogs.**]—Mh. VetMed. 14, 609-611. 1507

An illustrated account of adenocarcinoma of the right kidney in a male Scottish Terrier aged 8 years and adenocarcinoma of the bladder in a Welsh Terrier bitch aged 11 years.—R.M.

French, G. T. (1959). **A clinical and genetic study of eye cancer in Hereford cattle.**—Aust. vet. J. 35, 474-481. [Author's summary modified.] 1508

Herefords in tropical areas of Australia are peculiarly susceptible to eye cancer. A highly significant negative association was found between the incidence of precursor lesions of eyelids and the degree of eyelid pigmentation. A significant association was found between increasing incidence of lesions of the eyeball and decreasing eyelid pigmentation. The degree of corneo-scleral junction pigmentation showed weak, but not significant, correlation with the incidences of acanthosis and of plaques and papillomas.

Precursor lesions may subside spontane-



ously. It has not been established whether they tend to recur. Eye cancer is unusual in animals less than 4 years of age. Susceptibility to eye cancer reaches a peak at about 7 to 8 years of age and may then decline.

Estimates of heritability of eyelid pigmentation are high (0.64 to 0.83). It is recommended that attempts to reduce the incidence of eye cancer be based on selection for a high degree of eyelid pigmentation.

Wiesner, E. (1959). Beitrag zur Ätiologie der Rinderleukose: Boden—Rasse—Alter. [**Aetiology of bovine leucosis: soil—breed—age.**] —Mh. VetMed. 14, 600-602. 1509

In the German Democratic Republic bovine leucosis occurred in three well-defined areas each having the same type of leached, peaty soil and a high rainfall. Examination of blood from 500 cattle of 6 breeds revealed no evidence of higher incidence in any one breed. Of 4,592 cases for which State compensation was paid between 1954 and 1956, most (46%) were between 5 and 7 years old, although the range extended from 1 to 13 years.—R.M.

Gentile, G. & Colosi, A. (1959). La leucosi linfatica del cane. [**Lymphatic leucosis in dogs.**] —Nuova Vet. 35, 221-242 & 245-278. 1510

A detailed account based on 19 cases, with

a review of the literature and 11 illustrations, and with observations on triethylenemelamine and corticosteroid therapy.—R.M.

Belding, R. C. (1958). **Studies on lymphomatosis in turkeys.** — Dissertation, Ohio State Univ. pp. 76. Abst. from Diss. Abstr. 19, 3280. (1959). 1511

A naturally occurring turkey lymphoid tumour was adapted to intramuscular serial passage in poults. This neoplasm was highly malignant for the poults used; it killed nearly all inoculated poults 7-14 days after i/m inj. of 0.5 ml. of a 1:10 dilution of cells. Although cells from the fifth, sixth, and seventh turkey passages grew in intramuscularly inoculated young chicks, cells harvested from poults of the 8th-20th serial passages consistently failed to produce local neoplasms or visceral involvement in chicks from the same source. Chicks inoculated with cellular suspensions of turkey tumour did not die when later inoculated with cells of a highly virulent chicken tumour, although the latter did produce a neoplasm at the site of inoculation.

The results of this work suggest the possibility of developing a successful vaccine against lymphomatosis in the chicken from this or a similar strain of turkey tumour.

## NUTRITIONAL AND METABOLIC DISORDERS

Bardwell, R. E. (1959). **Osteomalacia in horses. I. Nutrition as an etiological factor.** — J. Amer. vet. med. Ass. 135, 72-76. 1512

Osteomalacia of horses has been attributed to various causes, but the most likely is nutritional imbalance, particularly of calcium and phosphorus. There may also be vitamin A deficiency. It is considered that lamenesses such as spavin, ring-bone, side-bones, the "wobbles" syndrome, "curb", splints, navicular disease, strained ligaments, bowed tendons, "stringhalt", "grunters" and "rheumatic disease" are early forms of osteomalacia and due to the same dietetic errors.—M.G.G.

Franke, E.-R. & Schienbein, L. (1959). Fütterungsschäden bei Schweinen durch einseitige Mischfutterzusammensetzung. [**Nutritional disorders in pigs due to unbalanced mixed feed.**] — Mh. VetMed. 14, 597-600. 1513

Among 2,000 store pigs on one premises there was an average daily loss from gastroenteritis (through death or emergency

slaughter) of 6 pigs. The total loss in a year was about 1,300 pigs. The illness was attributed to too much wheat (of Russian origin) and bad hygiene. No cases occurred after wheat was excluded from the ration.

—R.M.

Gromykhina, A. M. (1959). [**Stimulant action of preserved blood from slaughtered cattle, given to cattle in the feed.**] — Veterinariya, Moscow 36, No. 10 pp. 54-56. [In Russian.] 1514

Two oxen were given 700 g. daily of blood preserved with 2% calcium oxide or 1% formic acid. Examinations after 7, 14 and 21 days revealed increased stimulant action on secretory activity in the abomasum, rumen contractions and blood composition. Treatment with preserved blood was recommended for cattle with digestive disorders, hypocalcaemia and osteomalacia. Preserved blood could be stored in a dark place for 2 months.

—R.M.

Jowsey, J. R., Cook, F. D. & MacGregor, H. I. (1959). **The effect of route of administration upon growth response to penicillin by turkey poults.**—*Canad. J. Anim. Sci.* 39, 21-25. 1515

Studies with turkey poults confirmed that a comparable growth response occurred with oral, intramuscular and intravenous administration of penicillin. By use of the conventional microbiological method, a penicillin assay of the small intestine contents demonstrated reduced lactobacilli counts whichever route of administration was used. Coliform counts were increased, however, only when penicillin was added to the feed but not when injected by either route.—R. V. L. WALKER.

Krogh, N. (1959). **Studies on alterations in the rumen fluid of sheep, especially concerning the microbial composition, when readily available carbohydrates are added to the food. I. Sucrose.**—*Acta vet. scand.* 1, 74-97. [In English. Summaries in German and Norwegian. Author's summary modified.] 1516

Feeding of cane sugar in excess to sheep on a hay diet led to indigestion with marked changes in the microbial population, pH and physical properties of the rumen fluid. A predominantly Gram-positive flora developed in this sequence: amylolytic streptococci, lactobacilli, yeasts. The protozoa were killed and the Gram-negative flora greatly reduced. These changes in the rumen micro-organisms occurred rather abruptly after sugar had been given for some time.

A large streptococcal flora caused only a temporary fall in rumen pH, whereas the succeeding population of lactobacilli induced a constant high acidity in the rumen (pH 3.8-4.5). As a rule, an increase to alkaline reaction preceded the final drop in pH.

The physical properties (consistency, smell and colour) of the rumen fluid changed coincident with the alterations in flora.

Large amounts of epithelial cells were found in the rumen fluid when the sugar feeding resulted in rumenitis.

Severely altered rumen fluid may return to normal in a few days when the causative factor is eliminated.

Delak, M. & Adamič, Š. (1959). **Prilog poznavanju intoksikacije kod ovaca uzročene saharozom. [Sucrose intoxication in sheep.]**—*Vet. Arhiv* 29, 214-223. [In Croat. Summaries in English and French.] 1517

The toxic effect of conc. sucrose soln., given by mouth or by stomach tube, was studied in 44 sheep. The severity of clin.

symptoms increased with the size of the dose. Sheep given 5 g./kg. body wt. remained healthy, those given 40 g./kg. body wt. died within 8-13 hours. Lactic acid in the blood increased in proportion to the dose, but ketone bodies were constant. In those which died there was catarrhal gastro-enteritis, and degenerative lesions in liver, kidneys and heart muscle. Cattle given 3-5 g./kg. body wt. of a 20-30% sucrose soln. developed acute indigestion.—E.G.

Allcroft, R., Clegg, F. G. & Uvarov, O. (1959). **Prevention of swayback in lambs.**—*Vet. Rec.* 71, 884-889. [Authors' summary modified.] 1518

A hill flock of 128 ewes with a known history of swayback was used to assess the prophylactic effect of copper glycine. The flock was divided into two groups; 45 mg. copper as copper glycine was injected s/c into 44, and i/m into 20 ewes about mid-pregnancy; 64 ewes were controls. Sites of injection were examined three times. Only slight local reactions were observed in 10 ewes and no lameness in any. S/c injection was better than i/m.

Blood samples were taken for estimation of copper in December, January, February, and May. There was a marked increase in mean blood copper values one month after injection.

Swayback was confirmed in 11 lambs (10 from control ewes and 1 from a treated ewe). The results are similar to those obtained previously with copper sulphate given orally or intravenously to ewes on the same farm; they also indicate that one injection of 45 mg. copper as copper glycine to ewes about mid-pregnancy is an effective prophylactic against swayback.

Dutt, B. & Mills, C. F. (1960). **Reproductive failure in rats due to copper deficiency.**—*J. comp. Path.* 70, 120-125. [Authors' conclusions modified.] 1519

Reproductive failure was first noticed in mature female black hooded rats aged 3 to 4 months kept on a copper deficient diet in a pilot experiment. Of 18 rats on this diet, only three had litters. The oestrous cycle of all these animals showed no abnormality.

In a second experiment, out of 32 rats on several levels of copper only four of the eight receiving the highest level of 2 p.p.m. added copper produced young. The number of young born varied from 4 to 7. P.M. examination of the remaining rats after two months and nine



days on these diets gave unmistakable evidence of resorption of foetuses. Uterine nodules representing the previous sites of implantation were found in most of the rats.

Microscopic examination of the uteri bearing these nodules revealed various stages of reparative processes after resorption of foetal tissues.

Skerman, K. D., Sutherland, A. K., O'Halloran, M. W., Bourke, J. M. & Munday, B. L. (1959). **The correction of cobalt or vitamin B<sub>12</sub> deficiency in cattle by cobalt pellet therapy.**—*Amer. J. vet. Res.* 20, 977-984. 1520

Pellets of 90% cobalt oxide, weighing 20 g. with a specific gravity of 4, were administered into the oesophagus of 123 cattle on 9 farms in South Australia and Tasmania. Growth in the following 6-8 months was better than in 123 untreated cattle, and concentrations of vitamin B<sub>12</sub> in the liver were 2-3 times higher. Treated cows yielded more butter-fat. Of 173 cattle given a pellet at 6 weeks to 20 months of age, 149 retained it for at least 2-7 months, but only 39 of 90 lactating cows did so. Liver concentrations of less than 0.1 µg. of vitamin B<sub>12</sub> per g. wet weight were found in cattle with clinical Co deficiency. Cattle with 0.1-0.3 µg./g. appeared normal but grew better if treated.—M.G.G.

Hatzios, B. C. (1959). **Blood sugar variations and pancreatic islet alpha cell changes induced in goats by administration of cobaltous chloride.**—*Hellen. Ktēn., Thessaloniki* 2, 161-187. [In English. Summary in Greek.] 1521

In a goat a single oral dose of 180 mg./kg. cobaltous chloride caused mild, transient hyperglycaemia. Repeated, larger daily doses caused a more severe hyperglycaemia, liver, heart and kidney lesions and death. In normal goats a single i/v or s/c inj. of 20 mg./kg. plus hyaluronidase caused a marked transient hyperglycaemia, the intensity of which varied with the dose. Repeated equal doses caused duplication of reaction in the same animal. In goats with experimentally induced diabetes, inj. of CoCl<sub>2</sub> caused a transient hyperglycaemia, which was less marked than that in normal goats and was not followed by hypoglycaemia. In normal goats, i/v inj. of dihydroergotamine 30 min. before CoCl<sub>2</sub> inj. reduced hyperglycaemia by 45%. CoCl<sub>2</sub> caused selective autolysis of some of the alpha cells of the pancreas; persistence, regeneration and new formation of alpha cells were also observed. Hyperglycaemia in

normal and in alloxan-treated goats occurred even with marked alpha cell degeneration. Pronounced depletion of liver glycogen and haemorrhages in the adrenal medulla occurred simultaneously with alpha cell damage. It is concluded that hyperglycaemia is the result of a direct and an indirect effect (through the sympathetic nervous system) on the liver.

—T.E.G.R.

Mershon, M. M. (1959). **Tetany in cattle on winter rations. II. Stresses and mineral metabolism.**—*J. Amer. vet. med. Ass.* 135, 435-439. [For part I see V.B. 29, 492.] 1522

The authors described as "tetany" a syndrome of incoordination progressing into paresis and coma, sometimes with convulsions, in lactating beef cows and associated with low amounts of calcium and magnesium in the blood. It occurred only in winter and ceased when pasture was available. Aetiological factors were discussed, with reference to the literature on similar syndromes.—R.M.

de Groot, T. (1959). Enkele opmerkingen over het verband tussen de voeding en het serum-magnesium-gehalte. [**Relationship between nutrition and magnesium content of serum in cattle.**]—*Tijdschr. Diergeneesk.* 84, 1289-1300. [In Dutch. Summaries in English, French and German.] 1523

The author discussed the literature on factors which retard absorption of magnesium from the digestive tract with special reference to ammonium ions.—R.M.

Smith, R. H. (1959). **Absorption of magnesium in the large intestine of the calf.**—*Nature, Lond.* 184, Suppl. No. 11 pp. 821-822. 1524

Calves with fistula of the small intestine were fed on whole milk containing polyethylene glycol as a marker. In calves 2-4 weeks old the ratio of Mg to polyethylene glycol was much higher in the small intestine than in the faeces, while in calves 6-12 weeks old there was no consistent difference. It was estimated that, in the large intestine, the younger calves absorbed at least 40-70% of the Mg escaping absorption in the small intestine (25-40% of the dietary Mg), whereas the older calves did not absorb any appreciable amount.—M.G.G.

Ladrat, J., Larvor, P. & Brochart, M. (1959). **Recherches sur quelques cas de tétanie d'herbage. [Studies on grass tetany in cows.]**—*Rec. Méd. vét.* 135, 903-936. [Summaries in English and Spanish.] 1525

A study was made of 8 cases of grass tetany in a herd of 55 cows. Grass that

induced tetany did not differ from control grass in content of Mg, P, Na, K, and total and digestible N, but was poorer in Ca. The consumption of grass was in inverse proportion to the rainfall, which was high at the time of the outbreak. It appeared also that digestive trouble due to a low fibre content of the grass caused progressive inappetence. Although grass was in fact plentiful, the amount consumed, together with a supplement of molassed straw, supplied only half the energy requirements of a good milking cow. The Mg content of the serum was low (0.02-0.18 mg.%), and tended to be inversely related to the Mg content of the faeces. Factors in the aetiology of grass tetany were discussed.—M.G.G.

Inglis, J. S. S., Weipers, M. & Pearce, P. J. (1959). **Hypomagnesaemia in sheep.**—*Vet. Rec.* 71, 755-763. 1526

The levels of magnesium in the serum of sheep were examined over prolonged periods and a study was made of the association with season, weather, pregnancy, lactation, fasting and certain components of the herbage. Some results from naturally occurring hypomagnesaemia in other flocks are also included.—T.E.G.R.

Evdokimov, E. S. (1959). [**Permissible content of sodium chloride in pig feed.**—*Veterinariya, Moscow* 36, No. 10 pp. 57-58. [In Russian.] 1527

The stomach contents of poisoned pigs were found to contain 0.6-1% sodium chloride and the pig meal contained about 1%. It was established that doses exceeding 10 g. NaCl were dangerous to pigs aged 5-6 months. When the pig meal contained 0.7-1% NaCl it could be fed to young pigs if given mixed with an equal amount or twice the amount of bran.—R.M.

McCully, K. A., Maw, W. A. & Common, R. H. (1959). **Observations on the mineral metabolism of pullets. XII. The effect of protracted treatment with estrogen and with estrogen plus androgen on retention of sodium.**—*Canad. J. Anim. Sci.* 39, 1-5. 1528

Treatment of sexually immature pullets with oestrogen or oestrogen combined with androgen had no apparent effect on sodium retention.—R. V. L. WALKER.

Drake, C., Grant, A. B. & Hartley, W. J. (1959). **Selenium and animal health.**—*Proc. Ruakura Fmrs Conf. Week* pp. 61-70. Discussion: pp. 70-71. 1529

400 ewes in late pregnancy were fed 5 mg. Se, 400 were fed 300 mg. alpha tocopherol acetate, and 400 were not treated. The number of their lambs dying from white muscle disease in the first three days of life was 20 in the group fed Se, 41 in the control group, and 54 in the group fed vitamin E. On 16 farms where lambs were treated, the number dying from white muscle disease was 2 in those given 1 mg. Se, 21 in those given 300 mg. alpha tocopherol acetate, and 50 in controls. On 8 farms where lambs had died from the insidious form of ill thrift, 201 were fed 15 mg. Se within 4 weeks, and 201 were untreated. 55 untreated lambs died, compared with 16 treated, and the average weight gain of the survivors was 12 lb. and 20 lb. respectively. Other trials are reported in which lambs responded to Se and Se + Co. Selenium did not control ill thrift occurring at the autumn flush of pasture.—M.G.G.

Rahman, M. M., Davies, R. E., Reid, B. L. & Couch, J. R. (1959). **Selenium and exudative diathesis in chicks.**—*Poult. Sci.* 38, 1239-1240. 1530

Addition to the diet of selenium at 0.05 and 0.1 p.p.m., respectively, prevented exudative diathesis in chicks and poults fed a glucose/torula yeast diet.—F.E.W.

Maplesden, D. C., Harvey, J. D. & Branion, H. D. (1960). **Nutritional muscular dystrophy in calves: I. Addition of dried brewer's yeast, phosphorus and tocopherol to a dystrophogenic diet.**—*Canad. vet. J.* 1, 10-19. [Summary in French. Authors' summary modified.] 1531

Bull calves were used for the experimental production of muscular dystrophy. The basal diet consisted of 70% skim milk, 5% glucose and 25% "stripped" lard. The addition of alpha-tocopherol to the basal diet effectively prevented muscular dystrophy in the calves. The addition of brewer's yeast to the basal diet, or increasing the phosphorus content of the basal diet did not prevent it.

Century, B. & Horwitt, M. K. (1959). **Effect of fatty acids on chick encephalomalacia.**—*Proc. Soc. exp. Biol., N.Y.* 102, 375-377. [Abst. from authors' summary.] 1532

Corn (maize) oil or lard from which tocopherol had been removed, promoted chick encephalomalacia, whereas coconut oil, butter, linseed oil, and cod-liver oil did not produce symptoms, and olive oil had a questionable effect. The intake of linoleic acid appears to



be a primary factor in the aetiology of encephalomalacia, but some of the other fatty acids may secondarily increase or decrease this effect.

Morton, R. A. & Phillips, W. E. J. (1959). **Unsaponifiable constituents of rat tissues in relation to vitamin K status.**—*Biochem. J.* 73, 421-427. [Authors' introduction modified.] 1533

This paper is concerned with the effects of vitamin K deficiency on minor constituents of the unsaponifiable matter from selected rat tissues. A first approach was to produce a conditioned vitamin K<sub>2</sub> deficiency by adding sulphadiazine to the diet.

A second was to place all the animals on a basal diet free from vitamins K<sub>1</sub> and K<sub>2</sub>. The controls were given this diet plus a small amount of menaphthone and the deprived animals were given the basal diet plus 1% sulphadiazine to inhibit bacterial synthesis of vitamin K<sub>2</sub>. After 21 days all the animals were killed and various tissues were examined.

A third approach was to maintain rats for 45 days on a vitamin A deficient diet until the reserves had been heavily depleted. Some animals were then killed and the tissues examined. The remaining rats were divided into groups, one of which was given vitamin A and the other sulphadiazine. In this way it

was hoped to show any effects due to the double stress of vitamin A deficiency and vitamin K deficiency. Particular attention was given to ubiquinone concentrations.

Adameşteanu, I. & Stănescu, M. (1959). B<sub>1</sub>-Hypovitaminose bei Entenkücken. [**Thiamine deficiency in ducklings.**] — *Mh. VetMed.* 14, 489-493. 1534

In Roumania thiamine deficiency had been observed since 1949. Symptoms (nervous, digestive and circulatory) were provoked by heat (temperatures of over 40°C.) and sunlight. The most prominent symptom was bradycardia, with pulse reduced to a quarter of the normal rate. Ducklings responded rapidly to administration of 0.25 mg. thiamine. The deficiency syndrome was experimentally produced by feeding a ration that causes beri-beri in mammals.—R.M.

Leoschke, W. L. & Elvehjem, C. A. (1959). **Riboflavin in the nutrition of the chinchilla.** — *J. Nutr.* 69, 214-216. [Authors' summary modified.] 1535

Riboflavin is not a dietary requirement for the chinchilla. A diet containing as little as 0.39 µg. of riboflavin per g. produced normal growth. No symptoms of vitamin deficiency were noted in animals fed the low-riboflavin diet for 5 months.

*See also abstr. 1662 (report C.S.I.R.O., Australia).*

## DISEASES, GENERAL

Abdussalam, M. (1959). **Significance of ecological studies of wild animal reservoirs of zoonoses.**—*Bull. World Hlth Org.* 21, 179-186. [Summary in French.] 1536

Failure to control diseases such as rabies, plague and tularaemia is due to lack of accurate knowledge on the ecology of the wild reservoir hosts. The characteristics of zoonoses with wild animal hosts are described, and the factors which should be considered in the study of these diseases are listed.—M.G.G.

Ottosen, H. E. (1959). **Some statistics on calf mortality.**—*Nord. VetMed.* 11, 493-512. [In English. Summaries in German and Danish.] 1537

The survey was based on calves sent to rendering plants in Denmark between 1949 and 1957 and the results of examination of 8,715 dead calves received at The State Veterinary Serum Laboratory in Copenhagen between 1949 and 1956. In addition data from 147 herds with high calf mortality (22% of

calves lost) was compared with that from 64 herds with little or no mortality (3.5% lost). The proportion of deaths from non-septicaemic enteritis rose from 34% in 1949-52 to 49% in 1953-56. This appeared to be associated with increasing use of sulphonamides and antibiotics. Other important causes of death were coli septicaemia (20% of all deaths), pneumococcal septicaemia (8%), pneumonia (11%).

Mortality appeared to be lower in herds fed hay and silage than in those fed root crops or concentrates.—R.M.

Prohászka, L. (1959). A nutriatényésztés állategészségügyi vonatkozásai. [**Diseases of nutria.**]—*Mag. állator. Lapja* 14, 303-304. [In Hungarian.] 1538

P. gave details of the aetiology, symptoms, prevention and treatment of the common infectious diseases in nutria: salmonellosis, coli-enteritis, diplococcal and streptococcal septicaemia, pseudotuberculosis, virus

encephalomyelitis, coccidiosis and trichostrongylosis. The most frequently occurring non-infectious conditions were tympanites, strangulation and torsion of the intestines, nephritis, torsion and prolapse of the uterus, prolapse of the vagina, paralysis of the penis, wounds due to fighting, and frost-bite. He gave some details of the control of infertility of the nutria, and suggested methods of restraint during handling.—A. SEBESTENY.

Millar, R. (1959). **A clinical case of convulsive syndrome in a new-born foal.**—Aust. vet. J. 35, 489-492. [Author's summary modified.] 1539

This case, believed to be the first recorded outside Europe, showed fracture of the second, third and fourth ribs and myocardial damage, typical symptoms and post-mortem lesions associated with pressure at the time of birth. The lesions could not have been associated with human interference during birth nor could pre-clamping of the umbilical artery as suggested by some investigators have been involved.

Lopuchovský, J. (1959). Novokainová blokáda pri liečení paralytickej formy myoglobínúrie. [**Procaine treatment in paralytic myohaemoglobinaemia in horses.**]—Veterinářství 9, 51-53. [In Slovak.] 1540

Successful treatment in 72 horses with the paralytic form of myohaemoglobinaemia of varying severity was claimed by i/v doses of 2 ml./10 kg. body wt. of a 1% procaine soln. in saline, combined with cardiac stimulants, insulin and "Polysan" (colloidal magnesium hydroxide).—E.G.

Gadani, G. (1959). La pneumoinfadenite enfisematosa o pneumatosi cistica linfonodale dei bovini. [**Cystic pneumatosis of the lymph nodes in cattle.**]—Veterinaria, Milano 8, 256-257. 1541

The condition reviewed in this article is pulmonary emphysema (interstitial with occasional patches of alveolar emphysema) and pneumatosis of the associated lymph nodes in cattle thought to be due to feeding on dusty, mouldy or deteriorated food.

—T.E.G.R.

Varenika, D. (1959). Patomorfološka slika krvomokrenja goveda na području banja-lučkog sreza u zimskoj (1954) i ljetnoj (1955) sezoni, s obzirom na trajanje bolesti, te pol i dob životinja. Izvadak iz disertacionog rada. [**Seasonal influence, duration, and effect of sex and age on haematuria in cattle.**]

—Veterinaria, Sarajevo 8, 287-303. [In Croat. Summary in English.] 1542

Two forms of bovine chronic haematuria, occurring in the mountainous Banja Luka region of Yugoslavia were described, sub-clinical form, microhaematuria, in which blood in the urine was demonstrable only by laboratory methods, and the clinical form. Over 200 cattle with subclinical and 300 with clinical haematuria were examined and gross and histological lesions described. Microhaematuria was present in nearly all cattle in spring when they returned to pasture after a relatively short indoor period during the severest winter. At this time incidence of the clin. form was very low. In late summer and autumn incidence of the clinical form increased markedly. Age and sex appeared to have no direct effect on the incidence of the disease, although in young cattle below one year of age it was never observed.—E.G.

Alexander, T. J. L., Richards, W. P. C. & Roe, C. K. (1959). **An encephalomyelitis of suckling pigs in Ontario.**—Canad. J. comp. Med. 23, 316-319. 1543

During the last three years 44 outbreaks of a disease affecting the nervous system of unweaned piglets have been investigated. It is characterized by a high morbidity and mortality. The causal agent (believed to be a virus) has not yet been identified. This is an account of the clinical aspects, with a brief note on the clinical pathology and P.M. findings; differential diagnosis is discussed. Details of the pathology and experimental studies are to be published later.

—R. V. L. WALKER.

Gwatkin, R. (1959). **Rhinitis of swine. XII. Some practical aspects of the rhinitis complex.**

—Canad. J. comp. Med. 23, 338-346. 1544

A review of recent literature, with particular emphasis on prevention and control.

—R. V. L. WALKER.

Parrish, H. M., Clack, F. B., Brobst, D. & Mock, J. F. (1959). **Epidemiology of dog bites.**—Publ. Hlth Rep., Wash. 74, 891-903. 1545

Of 19,334 licensed dogs in Pittsburgh, 4.1% of bitches and 2.7% of males bit people in July and August, 1958. Working dogs, sporting dogs and dogs aged 6-11 months were more likely to bite than other dogs. The higher incidence in bitches was not attributed to the oestrous cycle nor to unweaned puppies. About a third of the bites were unprovoked.



School-children and people visiting houses in the course of their work were particularly susceptible.—M.G.G.

- Wilgram, G. F. & Ingle, D. J. (1959). **Renal-cardiovascular pathologic changes in aging female breeder rats.**—Arch. Path. 68, 690-703. 1546

Female rats discarded as breeders at the age of one year had varying degrees of pathological change in the circulatory system and kidneys. Some animals had stomach ulcers; others hypertension. Benign tumours were common, and malignant tumors occurred in a few.—R.M.

- Sturkie, P. D. & Joiner, W. P. (1960). **Effects of foreign bodies in cloaca and rectum of the chicken on feed consumption.**—Amer. J. Physiol. 197, 1337-1338. 1547

Previously the authors reported that a glass cannula inserted into the cloaca to collect urine, greatly decreased feed consumption [*Poult. Sci.* 38, 30 (1959)]. Foreign bodies in the form of small plastic buttons were sutured to various parts of the cloaca and rectum. Decrease in feed consumption only occurred if the foreign bodies were in the rectum.—R.M.

- Siller, W. G. (1960). **An unusual case of fowl paralysis.**—J. comp. Path. 70, 156-159. [Author's conclusions.] 1548

The macroscopic and histological appearance of a case of megacolon is described in a fowl which had shown no clinical nervous symptoms. Perivascular lymphocytic cuffing in the central nervous system and lymphocyte infiltration in the intestinal nerve led to the diagnosis of fowl paralysis.

- Rigdon, R. H., Ferguson, T. M. & Couch, J. R. (1959). **Spontaneous cataracts in turkeys.**—Amer. J. vet. Res. 20, 961-965. [Authors' summary modified.] 1549

Spontaneous cataract is described in 7 turkeys. This lesion was first observed in birds less than 3 months old. The lens changes frequently progressed until vision was markedly decreased. Detachment of the retina occurred in 2 cases. There are indications that the aetiological factors in this lens degeneration may be the same as in that occurring in chickens with lymphomatosis.

- Rybak, P. Y. (1959). [The principles of radiation pathology in animals.] pp. 231. Moscow: Gosud. izd. sel'skokhoz. literatury. 3 roubles. [In Russian.] 1550

A summary of information on the physics and biological action of ionizing radiations written for veterinary surgeons, with special reference to atomic bombs. It includes chapters on diagnosis and treatment of radiation sickness in farm animals, methods of protecting them from radiations, and inspection of meat.—R.M.

- Lippincott, S. W., Robertson, J. S., Bond, V. P., Cronkite, E. P., Easterday, O. D. & Farr, L. E. (1959). **Pathologic effects of thermal neutrons and the B<sup>10</sup> (n, Alpha) Li<sup>7</sup> reaction on skin.**—Arch. Path. 68, 639-650. 1551

This investigation was undertaken as part of a series on the effects in tissue of uncharged particles of both low and high energy. The pig was selected because its skin is histologically similar to that of man. Boron-17 was injected i/v as borax. The degeneration reaction of boron-10 into lithium-7 caused areas of atrophy and of epidermal and dermal necrosis. In one pig, a minute squamous-cell carcinoma was observed in the ear.—R.M.

- Brown-Grant, K. & Pethes, G. (1959). **Concentration of radio-iodide in the skin of the rat.**—J. Physiol. 148, 683-693. [Authors' summary modified.] 1552

After injection of radio-iodide into unweaned and adult rats a high percentage of the dose can be recovered from the skin in the first few hours.

The radioactivity of the skin at this time is due to the presence of radio-iodide in equilibrium with the blood; the uptake can be reduced or iodide already present can be discharged by administering potassium thiocyanate.

The high skin : blood ratios observed, and the results of thiocyanate administration, suggest that an active concentrating mechanism is involved.

No concentration was observed in the skin of the mouse or the g. pig and thiocyanate had no effect on skin content of iodine in these species.

The initially high skin content of <sup>131</sup>I falls rapidly in adult and slowly in unweaned rats until about 3% of the injected dose is present in the skin at 24 hours in the adult and at 260 hours in the unweaned rat. This residual radio-iodide is present in the hair.

- Meek, E. S. (1959). **Cellular changes induced by cadmium in mouse testis and liver.**—Brit.

J. exp. Path. 40, 503-506. [Author's summary modified.] 1553

Young adult mice received a single s/c inj. of cadmium chloride (0.5 ml./100 g. body wt. of a 0.1% soln.) which produced extensive testicular damage with total destruction of all tubular cells within 96 hours and occasionally some midzonal lesions in the liver.

Anon. (1959). [Papers read at the Conference on the comparative pathology of arthritis and rheumatism held at the National Institutes of Health, Bethesda, Maryland, February 5th-6th, 1959.]-Lab. Invest. 8, 1170-1498. 1554

Among the papers read at this conference were: Inherited dysplasia of the hip joint in dogs and rabbits, by J. R. M. Innes; Canine hip dysplasia, by G. B. Schnelle; Degenerative arthritis in the bovine, by J. L. Shupe; Pathogenesis of osteoarthritis in the horse (particularly as related to nutritional aspects), by B. F. Trum; Osteoarthritis in laboratory animals, by L. Sokoloff; Observations on the clinical signs and gross pathology of degenerative joint disease in aged bulls, by G. M. Neher & W. J. Tietz; Comparative views on the pathology of disk degeneration in animals, by H.-J. Hansen; Equine incoordination (ataxia of foals, "wobbles"), by T. C. Jones; Haemophilic arthropathy in dogs, by M. C. Swanton; Pulmonary hypertrophic osteoarthropathy in dogs, by T. C. Jones & G. B. Schnelle; Synovial gout in the parakeet, by H. G. Schlumberger; Avian nephritis and visceral gout, by W. G. Siller; Bacterial arthritis and tenosynovitis in poultry, by E. Jungherr; Transmissible synovitis in poultry, by N. O. Olson; Arthritis in chicks caused by a mycoplasma, by H. E. Adler; A rheumatoidlike arthritis in swine, by D. Sikes; Swine erysipelas and arthritis, by R. D. Shuman; Does vaccination against swine erysipelas afford protection against arthritis? by G. M. Neher & C. B. Swenson; Swine arthritis associated with pleuropneumonia-like organisms, by S. H. McNutt; Arthritis in ruminants due to pleuropneumonia-like organisms, by D. R. Cordy; Polyarthritis of lambs, by L. A. Griner; Skeletal and articular involvement in brucellosis of animals, by L. Lowbeer; Equine viral arteritis, by T. C. Jones; Myopathies of livestock, by W. J. Hadlow.—E.G.

Dirksen, G. & Bartling, K. H. (1959). Beitrag zur Behandlungen von Gelenk- und Sehnen-scheidenerkrankungen des Rindes mit Nebennierenrindenhormonpräparaten (Hydrocorti-

son, Fluorhydrocortison, Prednisolon). [Hydrocortisone, fluorhydrocortisone and prednisolone in the treatment of diseases of joints and tendon sheaths in cattle.] — Dtsch. tierärztl. Wschr. 66, 490-496. [Summary in English.] 1555

These corticosteroids were injected directly into the synovial cavity of inflamed joints or tendon sheaths in 35 cattle, of which 21 were completely cured and 6 others' improved. One or two injections were sufficient for acute inflammation; four injections for chronic inflammation. Dosage for joint cavities depended on the size of the cavity and averaged 125 mg. for hydrocortisone, 25-100 mg. for prednisolone and 6-12 mg. for fluorhydrocortisone (fluorocortisone B.P.C.)—R.M.

Møller, T. & Simesen, M. G. (1959). Leverbiopsi på kvaeg. I. Teknik og klinisk-diagnostisk anvendelse. [Liver biopsy in cattle. I.]—Nord. VetMed. 11, 719-730. [In Danish. Summaries in English, French and German.] 1556

The authors discussed experience gained by examining 400 liver samples obtained by needle biopsy. Seven cases are described as examples of the diagnostic value of biopsy. There are 6 photomicrographs.—R.M.

Eikmeier, H. (1960). Diagnostische Untersuchungen über die Lebererkrankungen des Hundes. [Diagnostic studies on liver diseases in dogs.] — Zbl. VetMed. 7, 22-58. [Summaries in English, French and Spanish. English summary modified.] 1557

Fifteen different tests were carried out on large numbers of dogs to determine their suitability to diagnose liver disease.

For the detection of liver damage only the determination of serum bilirubin and the bromsulphthalein test proved satisfactory. Laparoscopy was the best method to determine the nature of the liver damage, and the technique is described.

Mielke, H. (1959). Der BSP-Leberfunktions-test beim Hund. I. Mitteilung. Die direkte Bestimmung der Farbstoffretention. II. Mitteilung. Die Bestimmung indirekter Eliminationsgrößen. III. Mitteilung. Der Zwei-Farbstoff-Test. [The bromsulphthalein test for liver function in dogs. I. Direct determination of dye retention. II. Determination of indirect elimination. III. Using two dyes.] — Arch. exp. VetMed. 13, 358-380; 381-402 & 860-873. 1558

Direct determinations of bromsulphthalein



(BSP) in the serum were made in 70 dogs 3 and 45 min. after i/v inj. of the dye. Results were compared with liver lesions in 53 cases. Dye retention after 45 min. in healthy dogs ranged from 0 to 0.25 mg./100 ml. and in dogs with liver disease 0.46–0.9.

Indirect determinations were made 3–10 min. after i/v inj. of 5 mg. BSP and the results were expressed as the time taken to reach half the initial concentration (average 4.3 min. in healthy dogs) or as an elimination constant (0.07 in healthy dogs): both values were increased in dogs with liver disease.

The two-dye test used on human beings by Zimmer [*Arzt. Forsch.* **10**, 68 (1956)] was based on determination of dye in serum 5 min. after i/v inj. of a 1:3 mixture of trypan red and BSP. M. modified this test for use on dogs and claimed that it had several advantages over the ordinary BSP test.—R.M.

Thompson, S. W., Wiegand, R. G., Thomassen, R. W., Harrison, M. & Turbyfill, C. L. (1959). **The protein nature of acidophilic crystalline intranuclear inclusions in the liver and kidney of dogs.**—*Amer. J. Path.* **35**, 1105–1115. [Authors' summary modified.] **1559**

Acidophilic crystalline intranuclear inclusions observed within the epithelial cells of the

liver and kidneys of 9 dogs were shown to contain reactive groups normally associated with the presence of proteins or polypeptides. [See also *V.B.* **29**, 3947.]

Manning, J. P., Reber, E. F., Malhotra, O. P., Beamer, P. D., Boley, L. E. & Norton, H. W. (1959). **Phenolsulfonphthalein clearance as a measure of renal function in ewes.**—*Amer. J. vet. Res.* **20**, 858–862. **1560**

Sheep were injected i/v with phenol-sulphon-phthalein (PSP). Clinical examination, analysis of the blood and urine (collected simultaneously), and gross and histological examination of the kidneys and liver indicated that the animals were functionally normal. PSP excretion in the urine at 30 and 60 min. was 56 and 67% respectively (which is in fair agreement with 40 and 60% in man). Results of the excretion tests confirmed those of clinical and pathological examination—that kidney function was normal. Plasma analysis was made by the method used for cattle or by a modification of it (to avoid the turbidity that occurs in sheep plasma). Results were similar to those obtained for cattle. Calculated excretion, based on the loss of dye by the plasma, was higher than the actual excretion in the urine. Further work is required to assess the value of PSP disappearance from plasma as a kidney function test in sheep.—T.E.G.R.

## POISONS AND POISONING

Gallagher, C. H. & Simmonds, R. A. (1959). **Prophylaxis of poisoning by carbon tetrachloride.**—*Nature*, Lond. **184**, Suppl. No. 18 pp. 1407–1408. **1561**

Rats were protected against oral carbon tetrachloride by previous intraperitoneal treatment with nicotinic acid or tryptophane. As these substances are precursors of the respiratory co-factors, the pyridine nucleotides, the result supports the view that carbon tetrachloride increases the permeability of mitochondria, allowing respiratory co-factors to escape.—M.G.G.

Karlog, O. (1960). **Experimental studies on the effect of P-2-AM in acute poisoning with alkyl phosphates.**—*Nord. VetMed.* **12**, 37–46. [In English. Summaries in German and Danish. Author's summary modified.] **1562**

In both paraoxon and parathion poisoning in rabbits, cholinesterase (ChE) reactivation, expressed as relative ChE activity in erythrocytes and plasma, proceeds rapidly after intraperitoneal administration of P-2-AM

(pyridyl-2-aldoxim-N-methiodide) 75 mg./kg. body wt.

24 hours after dermal application of parathion (2 mg./kg.) on 4-day-old calves, a marked reactivation of ChE in whole blood can be obtained by intravenous injection of P-2-AM (50 mg./kg.). The ChE activity in the blood is not fully correlated to the clinical condition.

Trainer, D. O. & Karstad, L. (1960). **Salt poisoning in Wisconsin wildlife.**—*J. Amer. vet. med. Ass.* **136**, 14–17. [Authors' summary modified.] **1563**

Salt (NaCl) poisoning was diagnosed in Wisconsin in wild rabbits, pheasants, quail, and a pigeon during the winter of 1958–59. Affected animals showed signs of severe derangement of the central nervous system. The source of NaCl was salt spread on highways to control slippery road conditions. It is believed that severe weather and heavy snowfall predisposed to poisoning by creating "salt hunger" and restricting water intake.

Ezaki, Y. (1959). [Studies on enzootic fluorosis in cattle with special reference to mottled teeth.]—J. Jap. vet. med. Ass. 12, 383-388. [In Japanese. Abst. from English summary.] 1564

Mottled teeth were seen in about half of calves drinking water containing 0.6-5 p.p.m. of fluorine. Abnormal heart sounds were heard more frequently in cattle with mottled teeth. The urinary content of fluorine was higher in cattle ingesting excessive fluorine than in normal cattle.—M.G.G.

McIntosh, I. G., Staples, E. L. J. & Morris, L. G. (1959). The toxicity of muscle, liver, and heart of deer poisoned with sodium monofluoroacetate (1080).—N. Z. J. Sci. 2, 371-378. [Authors' summary modified.] 1565

Meat, hearts, and livers from deer poisoned with "1080" have been assessed for potential toxicity for man. The most toxic meat contained 0.92 mg. per 100 g. Acute poisoning in man eating these tissues from deer shot before symptoms of poisoning appeared could not occur, and chronic poisoning from daily ingestion of the tissues would be most unlikely.

I. Harrison, D. L. (1959). The toxicity of wood preservatives to stock. Part 1: Pentachlorophenol. Part 2: Coal tar creosote.—N. Z. vet. J. 7, 89-94 & 94-98. 1566

II. Harrison, D. L. & Mason, C. G. W. (1959). The toxicity of wood preservatives to stock. Part 3: The fixed arsenates.—Ibid. 120-125. 1567

I & II. The acute fatal and minimum toxic doses of pentachlorophenol were 120 and 27 mg./kg. body wt. for sheep and 140 and 35 mg./kg. for calves. The fatal chronic dose for sheep appeared to be 27-55 mg./kg. and for calves 35-50 mg./kg. The acute fatal dose of creosote for sheep and calves was 4-6 g./kg., calves being more susceptible. Sheep tolerated a daily drench of 0.5 g./kg. but 1-2 g./kg. daily caused death. In calves the fatal chronic dose rate was about 0.5 g./kg. daily. Shavings from wood that had been treated with "Boliden S25" (a copper-zinc-chrome arsenate soln.) was administered in daily doses of 112 g. to a calf weighing 150 kg. and a sheep weighing 26 kg. The calf died after 15 days, the sheep after 8 days. Sheep fed 56 or 28 g. of treated wood daily or a single dose of up to 281 g. were unaffected. A temporary loss of weight occurred in a sheep given 463 g. Sheep fed daily 28-112 g. of wood treated with the arsenical preserva-

tives "Tanalith U" or "Tanalith C" for 25 days were unaffected. Symptoms and P.M. findings were described. There is no danger to stock from wood treated with any of these preservatives.—M.G.G.

Fontanelli, E. (1959). Note avicole. [Poultry notes: tar poisoning.]—Zooprofilassi 14, 689-692. 1568

Illness occurred in a flock of hens put in a fowl-house which had been freshly treated with wood tar. Symptoms were diminished egg production, somnolence, anorexia and excessive thirst. Two birds died [P.M. findings not given] and the rest recovered after treatment, for 10 days, with methionine (by the mouth) and milk in the drinking water. After about 10 days the birds, which had moulted a few months previously went into a second moult (ascribed to the poison).

—T.E.G.R.

Filmer, J. F. & Johns, A. T. (1959). Facial eczema research. Intensive coordinated investigations since fungus discovery.—N. Z. J. Agric. 99, 303 & 305-312. 1569

Research is being carried out on growth conditions, toxic action, chemical components, fat composition and control of *Sporidesmium bakeri*. Attempts to control the fungus in the field with fungicides, slaked lime, superphosphate or a culture of *Bacillus subtilis* which prevented its growth in culture were unsuccessful. Substances inhibiting its growth were demonstrated in juices and extracts of sweet vernal and white and red clovers. Only one of 14 sheep developed liver damage on pasture that had been dressed 5 times with  $\text{CuSO}_4$  between December and February, compared with all of 16 sheep on untreated pasture. As the amount of copper applied did not affect growth of the fungus in lab. experiments, it is possible that a protective effect was exerted by the high Cu content of the liver.—M.G.G.

—Thornton, R. H. & Sinclair, D. P. (1959). *Sporidesmium bakeri* and facial eczema of sheep in the field.—Nature, Lond. 184, Suppl. No. 17, pp. 1327-1328. 1570

*Sporidesmium bakeri* spores were plentiful on ungrazed pasture plots that had been mown closely every 7-14 days but scarce on a grazed plot in which the grass was 4-6 inches long and contained a high proportion of dead leaf and stalk. Counts were much higher when the clippings were left on the pasture than when they were removed. All



of 20 lambs placed on the mown plots developed extensive liver damage, whereas 10 lambs on the grazed plot had only slight damage. It is considered that freshly killed or damage herbage and the length of the herbage are important factors in the development of *S. bakeri*.—M.G.G.

Senior, V. E. (1960). **Algal poisoning in Saskatchewan**.—Canad. J. comp. Med. 24, 26-31. [Author's summary modified.] 1571

In Saskatchewan the dry summer of 1959 reduced the water level of the lakes in the Qu'Appelle valley and hot weather provided optimum conditions for the development of surface scum and algae. Wind had piled much of this scum at the water's edge and algal poisoning is held responsible for fatalities in dogs and sickness and mortality in horses and cattle. Severe gastro-enteritis with haemorrhage was a feature of the P.M. findings on a limited number of specimens. Toxic algal types were identified by microscopic examination and the toxicity of the water was confirmed by intraperitoneal inoculation into mice. Sporadic cases in cattle and horses were reported in different parts of the province and rapid death accompanied by severe gastro-enteritis was recorded. The P.M. findings were at variance with present knowledge in regard to the nature and action of the toxin and to some extent at variance with those reported by other workers. It is suggested that laboratory research using a single species of alga with mice as the sole test animal is unlikely to give results comparable to the consumption by a cow or dog of a massive quantity of so-called water bloom comprising a variety of potentially toxic types.

Michael, P. W. (1959). **Oxalate ingestion studies in the sheep**.—Aust. vet. J. 35, 431-432. 1572

Attention is drawn to the inadequacy of considering total oxalate concentrations of plants in relation to oxalate poisoning. Species like soursob and some *Rumex* have sap of low pH (about 2). Consequently oxalic acid is present chiefly as acid oxalate ions and very little insoluble  $\text{CaC}_2\text{O}_4$  is formed in the sheep after ingestion, but much  $\text{KHC}_2\text{O}_4$  is. On the other hand, species like some *Chenopodiaceae* have sap of high pH (about 5 or 6) in which oxalic acid is present largely as oxalate ions, leading to the formation of relatively large amounts of insoluble  $\text{CaC}_2\text{O}_4$  or of the soluble

sodium and magnesium salts. It is suggested that the administration to sheep of these different derivatives of oxalic acid may lead to different clinical results.

—C. H. GALLAGHER.

Lindt, S. (1959). Über eine Schachtelhalmvergiftung bei Kälbern. [*Equisetum poisoning in calves*.]—Schweiz. Arch. Tierheilk. 101, 461-464. [Summaries in English, French and Italian.] 1573

An outbreak of *E. palustre* poisoning in calves after 2 weeks' drought is described. Besides the usual symptoms, patchy sweating was observed. The animals recovered after treatment with B vitamins and stimulants.

—M.G.G.

Harker, K. W., Gourlay, R. N. (1959). **Stock poisoning attributed to the leaves of the shrub *Bersama abyssinica***.—E. Afr. agric. J. 25, 63-65. 1574

Leaves resembling those of *B. abyssinica*, a common shrub in East Africa, were found in the stomach contents of 3 cows that died with severe nervous symptoms. A calf given 4 g. of dried leaves developed similar symptoms and had to be slaughtered. 2 rabbits fed the leaves died after showing lack of muscular control.—M.G.G.

Walker, D. J. (1959). **Blood acetylcholinesterase in *Phalaris* staggers**.—Nature, Lond. 184, Suppl. No. 18 p. 1411. 1575

No difference in the acetylcholinesterase content of the blood was found between 12 normal sheep and 12 sheep with phalaris staggers. Sheep given a powerful anti-cholinesterase (demeton) by mouth did not develop nervous debility.—M.G.G.

I. Boyd, E. M., Broughton, R. J., James, J. (1960). **The acute oral toxicity of benzylpenicillin potassium**.—Arch. int. Pharmacodyn. 123, 295-304. 1576

II. Boyd, E. M., Broughton, R. J., James, J. (1959). **The acute oral toxicity of benzylpenicillin ammonium**.—Antibiot. & Chemother. 9, 739-743. [Summary in Spanish p. 766.] 1577

I. The average lethal single dose given by mouth was 6.7 g./kg. body wt. for rats and 6.5 g./kg. for mice. The cause of death was respiratory failure, with or without convulsions, associated with acute gastro-enteritis and cardiovascular shock. Death occurred

between 2 and 24 hours after administration.

II. Average lethal doses were 8.4 g./kg. body wt. for rats and 7.8 g./kg. for mice.

See also absts. 1662 (report C.S.I.R.O., Australia); 1668 (report, British Guiana).

## PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

Palmer, A. C. (1959). **Injection of drugs into the cerebral ventricle of sheep.**—*J. Physiol.* 149, 209-214. 1578

Cannulae were implanted permanently into the lateral ventricles of five sheep and the effects of intraventricular injection of the following drugs were studied: eserine, di-isopropylfluorophosphonate, neostigmine, acetylcholine, carbachol, nicotine, adrenaline, noradrenaline.—R.M.

Ayre-Smith, R. A. (1959). **Use of tranquillizers prior to the transport of slaughter cattle.**—*E. Afr. agric. J.* 25, 73-77. 1579

24 steers inoculated s/c with 1-2.5 mg./kg. of trimeprazine tartrate were docile 1-1½ hours later but those given the higher doses tended to lie down and one showed respiratory distress. The effect lasted about 3 hours. In 29 steers given 1 mg./kg. of this drug s/c or 0.5 mg./kg. of chlorpromazine hydrochloride i/m before a journey by rail lasting 14 hours, the degree and incidence of bruising were less than in 30 untreated steers. Both drugs damaged the tissues at the site of injection.—M.G.G.

Kobayashi, S., Ohishi, I., Kume, S. (1959). **[Inhibitory effects of promazine hydrochloride and chlorpromazine hydrochloride on reactions of dogs to arsenic compounds.]**—*J. Jap. vet. med. Ass.* 12, 432-436. [In Japanese. English summary modified.] 1580

Although arsenicals are effective for canine filariasis, they often cause emesis or nausea. Promazine hydrochloride and chlorpromazine hydrochloride prevent emesis and nausea.

Three different preparations were injected: (1) 0.75-1 mg. As/kg. body wt. of dichlorphenarsine hydrochloride only; (2) arsenical plus promazine hydrochloride (0.5-1 mg./kg.); (3) arsenical plus chlorpromazine hydrochloride (0.5-1 mg./kg.). Compared with (1), the other two were markedly effective in preventing emesis and nausea.

Additional experiments were conducted with the lethal dose (4 mg. As/kg.) of arsenical. Some dogs were given the arsenical

Symptoms and the cause of death were similar to those observed for the potassium salt.

—R.M.

and promazine hydrochloride (2 and 5 mg./kg.). Others were given the arsenical and chlorpromazine (5 mg./kg.). Dogs given As plus tranquillizer survived. Reactions of shock produced by the lethal dose of arsenical were dramatically averted by chlorpromazine and the dogs maintained their appetite and vitality.

Poulsen, E. (1959). **Renale Exkretion von Sulphathiazol und Sulfamethazin bei Kühen. [Renal excretion of sulphathiazole and sulphadimidine in cows.]**—*Zbl. VetMed.* 6, 127-137. [Summaries in English, French and Spanish.] 1581

Comparison of concentrations of the drugs in blood and urine after oral or intravenous administration revealed that their excretion in cows was similar to that in other mammals. While sulphathiazole was excreted by glomerular filtration and by tubular excretion, sulphadimidine was in addition reabsorbed in the tubules. Renal clearance was not influenced by diuresis.—R.M.

Garrod, L. P. [Edited by] (1960). **Antibiotics in medicine.**—*Brit. med. Bull.* 16, 1-85. 1582

The January issue of the *British Medical Bulletin* is a collection of 15 review articles dealing with all aspects of antibiotics: chemistry, toxicity, therapy, prophylactic use, drug-resistant pathogens. Thus G. W. Taylor (pp. 51-54) discussed the preventive use of antibiotics in surgery and concluded that they should not be used in clean surgical procedures because there was no evidence of reduction in the incidence of infection in such cases and because of various possible complications. The dangers of antibiotic treatment were discussed by D. M. Dunlop (pp. 67-72) and clinical problems of drug-resistant pathogens were dealt with by E. J. L. Lowbury (pp. 73-78).

From the laboratory side there are articles on laboratory control of antibiotic therapy by J. C. Gould (pp. 29-34); laboratory uses of antibiotics in bacteriology and virology by R. Cruickshank (pp. 79-81).

This collection of reviews merits the careful attention of all who use antibiotics because



the views expressed provide an antidote to the often extravagant claims of drug manufacturers.—R.M.

Rasmussen, F. (1959). **Mammary excretion of benzylpenicillin, erythromycin and penethamate hydroiodide.**—Acta pharm. tox., Kbh. 16, 194-200. [In English.] 1583

The antibiotics were administered to cows and goats by continuous intravenous drip. Samples of blood and milk were taken at intervals of 30 min. starting 60-90 min. after commencement of administration. The ratio of plasma conc. to milk conc. was nearly equal in the case of penicillin but it was 4 or 5 with erythromycin and 5 or 6 with penethamate [the diethylaminoethyl ester of benzylpenicillin]. Thus, owing to the difference in pH between plasma and milk, the conc. of penethamate in milk was 5-7 times higher than that in plasma. It was therefore possible to maintain a high concentration in milk.—R.M.

Piccotin, G. (1959). La criseociclina nella terapia della diarrea e della broncopolmonite dei vitelli. [**Tetracycline hydrochloride in the treatment of diarrhoea and bronchopneumonia of calves.**]—Veterinaria, Milano 8, 127-128. 1584

Tetracycline hydrochloride ("Criseocycline") was not toxic for calves, even in doses of up to 20 mg./kg. body wt. Its therapeutic value was demonstrated in all 16 cases treated.—F. R. PAULSEN.

Said, A. H. (1959). Vergelijkende studies over het gehalte in het bloedserum van oraal toegediende penicilline V en procaine-penicilline bij de hond. [**Blood concentrations of penicillin V and procaine penicillin after oral administration to dogs.**]—Vlaams diergeneesk. Tijdschr. 28, 294-301. [In Flemish.

See also absts. 1289 (effect of penicillin on the structure of staphylococcal cell walls); 1330 (nitrofurazone in swine paratyphoid); 1334 (quaternary ammonium compound for *S. pullorum* disinfection); 1369 (aspergillosis); 1380 (prothidium); 1381 (metamidium); 1382 (stilbamidine); 1384 (berenil); 1389 (paromomycin); 1413 (mepacrine); 1464-1466-1471, 1473-1477 & 1479-1485 (parasiticides); 1486-1488, 1491, 1494-1497 & 1503 (anthelmintics); 1561 (carbon tetrachloride poisoning).

## PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Ledger, H. P. (1959). **A possible explanation for part of the difference in heat tolerance exhibited by *Bos taurus* and *Bos indicus* beef cattle.**—Nature, Lond. 184, Suppl. No. 18 pp. 1405-1406. 1589

The different heat tolerance of the 2 species may be partly related to differences in the deposition of fat. Comparison of the carcass fat in 27 *Bos indicus* with that reported by Callow (1948) in *Bos taurus*

Summaries in English, French and German.] 1585

After a single i/m inj. of 400,000 i.u. procaine penicillin, a therapeutically active blood concentration was maintained for 16 hours. Phenoxymethylpenicillin (penicillin V) given by mouth in 120-mg. doses maintained satisfactory blood conc. for 4-6 hours.—R.M.

MacLeod, J., Nelson, W. O. (1959). **Griseofulvin and human spermatogenesis.**—Proc. Soc. exp. Biol., N.Y. 102, 259-260. [Authors' summary.] 1586

Daily administration of 2 g. of griseofulvin to 14 normal men for 3 months did not produce significant changes in semen quality or in histology of the testes of 8 of the individuals.

Bassignana, G. (1959). Impiego degli steroidi anabolizzanti nel cavallo da corsa. [**Anabolizing steroids in the treatment of horses.**]—Veterinaria, Milano 8, 262-263. 1587

Satisfactory results are recorded for "Steranabol" [4-chloro-testosterone acetate] in the treatment of such conditions in horses as protein deficiency, fatigue and debilitating disease.—T.E.G.R.

Lock, J. A., Harthoorn, A. M. (1959). **The use of succinylcholine chloride (suxamethonium chloride) for the control and management of wild animals.**]—Vet. Rec. 71, 919-920. 1588

In pilot experiments in Uganda this drug was used for immobilizing wild buffalo requiring vaccination against rinderpest, and for immobilizing giraffe and antelope in farming areas so that they could be transported to undeveloped areas. It was also used in the marking of wild animals. It is suggested that side effects may be mitigated by the addition of substances such as atropine.—M.G.G.

revealed that, during fattening, the subcutaneous fat rose from 5.3 to 11.3% of the carcass in *Bos indicus*, against 4.4 to 14.4% in *Bos taurus*. Intermuscular fat, on the other hand, increased from 10.6 to 25% in *Bos indicus*, compared with 10.8 to 19% in *Bos taurus*.—M.G.G.

Britton, H. G., Nixon, D. A., Wright, G. H. (1959). **Hypoxic death in the foetal sheep.**—

J. Physiol. 149, No. 1 pp. 37P-38P of Proceedings. 1590

Experiments confirmed that a gross depletion of cardiac glycogen takes place in acute hypoxia [*V.B.* 29, 3628]. An experiment in which the lactic acid level was artificially raised indicated that the blood lactate was not a limiting factor. In recovery experiments gross cardiac glycogen depletion did not occur, and foetal death must have been due to other factors. The blood and cardiac lactate values in the recovery experiments were extremely high and may have been the cause of death but the severe acidosis and the rise in the plasma potassium may have also contributed. —R.M.

Tyler, C., Simkiss, K. (1959). **Studies on egg shells. XII. Some changes in the shell during incubation.**—J. Sci. Fd Agric. 10, 611-615. [Authors' summary modified.] 1591

The changes were studied by histochemical tests and plastic embedding techniques. It has been confirmed that the membrane comes off all the shell, apart from that over the air space, by about the 15th or 16th day. The membrane does not come away cleanly from the shell but carries with it the ends of the mammillary knobs, including the mammillary cores. At the end of incubation there is still a great deal of calcium carbonate present on the membrane.

Thiéry, G. (1959). Étude des variations tissulaires saisonnières chez certaines espèces animales domestiques dans la région de Dakar. [**Seasonal variations in enzyme activity of tissues in domestic animals in Dakar, in relation to climate.**]—Rev. Elev. 12, 273-292. [Summaries in English and Spanish.] 1592

The lipase and alkaline phosphatase content of the organs of fowls fluctuated markedly in the course of a year. From a peak at the beginning of January it decreased by about a third until April, rose to a second, equal peak in May-June, then dropped to a very low level in October. The climate at Dakar is dry from November to June, and wet from July to October. A similar, but less pronounced cycle was found in cattle, goats and dogs, but not in lab. animals. The findings are discussed in relation to climate and variations in the electric field, and susceptibility to infective agents and carcinogens.—M.G.G.

Austad, R., Garm, O. (1959). **Periodic acid-Schiff-positive material and alkaline phosphatase in the uterine wall of the pig during**

**the sexual cycle.**—Nature, Lond. Suppl. No.13 pp. 999-1000. 1593

Biopsy samples obtained by laparotomy, as well as post-mortem samples were used, from sites 10 cm. respectively from the bifurcation, and horn tips. Periodic acid-Schiff-positive material appeared in the glandular epithelium and the musculature, from the 9th day until the recurrence of oestrus. In the surface epithelium it appeared only at the 12th day and declined again after about the 15th. There was no site difference. No periodic acid-Schiff-positive material, or alkaline phosphatase, was recovered from a castrate sow.

Alkaline phosphatase occurred in the sub-epithelial connective tissue and glandular epithelium, where it showed no cyclic variation. In the surface epithelium, the enzyme was present at oestrus and increased for the next 5-6 days, disappearing over the 7th-11th days.—F. L. M. DAWSON.

Paducheva, A. L. (1959). [**Breed differences in sulphur metabolism of sheep, in relation to wool growth.**]—Proc. Lenin Acad. agric. Sci. 24, No.8 pp. 15-19. [In Russian.] 1594

Metabolism of various compounds labelled with radiosulphur was studied in ewes of local fat-rumped breeds, Merino and cross-bred ewes. Incorporation of radiosulphur into wool was also studied in sheep of the Romanov breed. The results are presented in five tables which show the sulphur content of skin, wool and muscle in the various breeds, at different times of the year, and under different systems of management. Differences in metabolism and in accumulation of sulphur in hair were determined by the stage of growth and not by breed characteristics or by the nature of the hair coat.—R.M.

Wood, H. G., Gillespie, R., Hansen, R. G., Wood, W. A., Hardenbrook, H. J. (1959). **Arteriovenous <sup>14</sup>CO<sub>2</sub> differences and the pentose cycle in the cow's udder.**—Biochem. J. 73, 694-701. [Authors' summary modified.] 1595

The metabolism of the lactating cow's udder was investigated by determinations of arteriovenous differences in the isotope concentrations of CO<sub>2</sub> of the udder during continuous injection of labelled acetate or glucose. The isotope concentrations of the blood glucose and acetate were also determined in the venous blood of the udder.

The carbon of acetate was estimated to be oxidized to CO<sub>2</sub> in the udder at about the same rate as that of glucose.



Glucose was injected into the pudic artery of a cow and the specific activities of the  $\text{CO}_2$  of venous blood of the udder were determined. After injection of [ $1\text{-}^{14}\text{C}$ ] glucose the specific activity of the  $\text{CO}_2$  was much greater than it was after [ $6\text{-}^{14}\text{C}$ ] glucose. These results indicate that the pentose cycle occurs in the udder of the lactating cow.

The equilibration between the glucose, acetate and bicarbonate of the blood and that of the pools of the udder was investigated. This equilibration alters the specific activity of the compounds and makes it difficult to apply tracer-dilution methods in the intact animal.

Rook, J. A. F., Wood, M. (1959). **Potassium and lactose in milk in relation to the physiology of milk secretion.**—*Nature*, Lond. **184**, Suppl. No.9 pp. 647-648. 1596

Potassium content remained fairly constant in milk from a given cow. Variation between different cows was 140-200 mg./100 g. of milk. Lactose content was inversely related to potassium content. It was suggested that potassium was derived from intracellular fluid while lactose was synthesized within the alveolar cells of the udder. The two components were associated with different phases of the water present in milk.—R.M.

Bouw, J. (1958). **Bloodgroup studies in Dutch cattle breeds.**—Thesis, Utrecht pp. 84. [In English. Summaries in French, German and Dutch.] 1597

B. discussed the literature and gave results of blood-group determinations in 884 Friesian and 371 Meuse-Rhine-Yssel bulls. The offspring of bulls of blood groups A and Z gave milk with a higher fat content than those of group V bulls.—R.M.

Kohli, R. N., Bhatt, P. L. (1959). **A study on the normal specific gravity of blood, serum and plasma of the camel.**—*Indian vet. J.* **36**, 494-497. [Authors' summary modified.] 1598

In a study on the blood of 50 healthy adult male camels the average sp. gr. was 1047 for whole blood, 1024 for plasma and 1026 for serum.

Dal Santo, F. (1959). Mancanza del fattore VII nel siero di sangue dei polli. [**Deficiency in factor VII in fowl serum.**]—*Acta med. vet.*, Napoli **5**, 347-359. [Summaries in English and French.] 1599

In a study of blood coagulation it was observed that for the determination of prothrombin time of mammals there were no fundamental differences between venous and

mixed blood. In fowls coagulation follows the standard pattern in which there is in the circulating blood a compound formed by the combination of prothrombin and heparin. During the process of coagulation thromboplastin, combining with heparin, liberates prothrombin which, through the action of calcium, produces active thrombin. In fowls from 2 flocks prothrombin time was very long owing to deficiency in factor VII. In these fowls, whose coagulation time was normal, this is considered physiological. If this phenomenon occurred regularly it would provide a rapid and reliable method of determining the presence and quantity of factor VII in mammalian serum.—T.E.G.R.

Di Domizio, G., Dal Santo, F. (1959). Presenza nelle pareti vasali di mammifero di un fattore accelerante la reazione del tempo di protrombina nel plasma di pollo. [**Presence in blood vessel walls of a factor accelerating prothrombin time in fowls.**]—*Acta med. vet.*, Napoli **5**, 361-369. [Summaries in English and French.] 1600

In the arteries there is a well balanced system of coagulation consisting of heparin, supplied by the adventitia; thromboplastin, supplied by the muscular layer; and an accelerating factor (factor VII which was not present in the fowls examined) supplied by the endothelial cells. Neutralization of thromboplastin in arteries with endoarteritis may be considered as a defence mechanism tending to a normal flow of the blood over the roughened vessel wall while the accelerating factor, activating coagulation at blood level, persists in the endothelium. It is considered that factor VII is formed by the vessel endothelium whence it passes into the circulating blood. It seems possible that increased production of factor VII may bring about coagulation at the level of the endothelium due to an increase in the adhesive properties of the platelets.

—T.E.G.R.

I. Stünzi, H., Teuscher, E., Bolliger, O. (1959). Systematische Untersuchungen am Herzen von Haustieren. I. Mitteilung: Untersuchung am Herzen der Katze. [**Systematic studies on the heart in domestic animals. I. Cats.**]—*Zbl. VetMed.* **6**, 101-117. [Summaries in English, French and Spanish.] 1601

Stünzi, H., Teuscher, E., Glaus, A. (1959). Systematische Untersuchungen am Herzen von Haustieren. 2. Mitteilung: Untersuchungen am Herzen des Schweines. [**Systematic studies on the heart in domestic animals. II.**

Pigs.]—Ibid. 640-654. [Summaries in English, French and Spanish.] 1602

I & II. Measurements were made of the weight and size of the whole heart and the dimensions of the ventricles of 115 cats and 102 pigs. Size of heart was more closely related to length of body than body weight. Changes in dimensions of hypertrophic hearts were described.—R.M.

Fisher, E. W., Dalton, R. G. (1959). **Cardiac output in cattle by the dye injection method.**—J. Physiol. 149, No.1 pp. 16P-17P of Proceedings. 1603

Thirty determinations were made on 26 cattle whose weights were between 100 and 600 kg. The mean value of output was 113 ml./kg./min. with a standard deviation of  $\pm 11$  ml.—R.M.

Rubenkova, A. A. (1959). **Changes in blood pressure of cows before and after calving.**—Sechenov J. Physiol. 45, 1254-1258. [In Russian.] 1604

Arterial blood pressure was higher than normal at the second month of pregnancy, the last stage of pregnancy, the beginning of calving, 1-2 days after calving, and during oestrus. Lowered pressure occurred at 5-8 months of pregnancy, and during 12 hours after calving. Measurements were made on 60 cows of the Kostrom and Friesian breeds with the aid of an oscillograph connected to an artery in the tail.—R.M.

Lloyd, S. (1959). **The vascular responses of the rat during the reproductive cycle.**—J. Physiol. 148, 625-632. [Author's summary modified.] 1605

Observations were made on the effects of ovarian hormones on vascular response to oxytocin, vasopressin and acetylcholine.

In female rats, oxytocin had a pressor and constrictor action during the period of natural oestrus, and temporarily after administration of stilboestrol or progesterone. Vasopressin had a pressor action greater than normal at these same times. The response to acetylcholine showed no such variation.

Ovariectomy caused a temporary increase in dilator response to oxytocin, and a reduction in the pressor action of vasopressin.

In male rats oxytocin dilated the mesenteric vessels, and did not affect the blood pressure; after administration of stilboestrol and progesterone or stilboestrol alone the male rats, like oestrous females, showed vasoconstriction and a pressor response.

Barnicoat, C. R. (1959). **Wear in sheep's teeth.**

**VI. Chemical composition of teeth of grazing sheep.**—N.Z. J. agric. Res. 2, 1025-1040. [Author's summary modified.] 1606

Excessive wear of incisor teeth of grazing sheep occurs in parts of New Zealand.

Analyses were made of enamels and dentines from teeth of 5-year-old ewes in various areas. Estimations of calcium, phosphorus, carbonate, sodium, magnesium, nitrogen, citrate, and 19 micro-elements disclosed no differences. There were, however, significant differences in fluorine contents.

Fluorine contents (whole teeth) varied from 28 to 320 p.p.m., the higher amounts being in teeth from ewes on pastures top-dressed with phosphatic manures, which contain about 1% fluorine.

Variations in tooth quality (as judged by wear) could not be correlated with chemical composition. The average composition, incidentally, is remarkably similar to that recorded for human teeth.

These results support the theory that substances in the rapidly growing leaves of high-yielding grasses and clovers soften the teeth either by dissolving or chelating their inorganic constituents, or by other types of attack with enzymes. These destructive processes would probably be further increased by the abrasive action of fibre in the grasses.

Barnicoat, C. R., Hall, D. M. (1960). **Attrition of incisors of grazing sheep.**—Nature, Lond. 185, 179. 1607

When dentine was exposed to fractions of juices of pasture plants, it was etched most by freshly expressed juices of grasses and clovers containing enzymes, organic acids, sugars, phosphates, amino-acids and polypeptides. The action was strongest during the lush spring growth. The central non-calcified core of the odontoblast process was etched more quickly than the dentinal matrix. The etching appeared to be due mostly to proteolysis.—M.G.G.

Ash, R. W., Kay, R. N. B. (1959). **Stimulation and inhibition of reticulum contractions, rumination and parotid secretion from the stomach of conscious sheep.**—J. Physiol. 149, 43-57. [Authors' summary modified.] 1608

Mechanical and chemical stimuli were applied through a large-diameter cannula to the reticulo-rumen and oesophagus of conscious sheep. Reticulum contractions and parotid secretion were recorded simultaneously.



Stretching the terminal oesophagus, cardia, reticulo-rumen fold or reticulo-omasal orifice caused large increases in parotid secretion. Light tactile stimulation of these areas and of the walls of the reticulum and the anterior pillar had a small effect on parotid flow but frequently accelerated reticulum contractions and caused rumination. Distension of the rumen sacs with a balloon inhibited both motility and saliva flow.

Similar responses to mechanical stimulation were obtained irrespective of whether the reticulo-rumen contained digesta or had been emptied.

The application of a local anaesthetic to the reticulum abolished the regular contractions of the organ and the contractions caused by vagal stimulation. The rumen continued to contract regularly.

The introduction of fatty acid solutions buffered at pH 3.7-4.0 inhibited reticulo-rumen contractions and caused a transient increase in parotid secretion.

The role of stimuli acting in the reticulo-rumen on normal rumination behaviour is discussed.

Kay, R. N. B., Phillipson, A. T. (1959). **Responses of the salivary glands to distension of the oesophagus and rumen.**—*J. Physiol.* 148, 507-523. [Authors' summary.] 1609

The effects of distension of the rumen, oesophagus and abomasum on salivary secretion were studied in sheep and calves under chloralose anaesthesia.

When the cervical oesophagus was tied, inflation of the rumen with free gas led to increased secretion by the parotid glands at pressures up to 20 mm. Hg and to progressive inhibition of secretion at higher pressures.

When the oesophagus was tied immediately above the cardia, distension of the oesophagus alone had a purely excitatory effect and inflation of the rumen alone a purely inhibitory effect. Distension of the abomasum had a weak and inconstant inhibitory effect.

The afferent fibres concerned in the excitatory responses were in the cervical vagus nerve, and some of those concerned in the inhibitory responses were in the vagus at the level of the diaphragm.

Little submaxillary or sublingual saliva was secreted. The flow of residual saliva dripping from the mouth and the secretion of saliva by the inferior molar glands changed in parallel with parotid secretion. The volume of residual saliva secreted was variable but

sometimes equalled the volume of parotid saliva.

High pressures in the rumen caused increases in arterial blood pressure that sometimes culminated in violent fluctuations, and caused irregularity or cessation of respiration.

Oesophageal contractions were sometimes caused by distension of the oesophagus and rumen.

Smith, R. N. (1959). **The arrangement of the ansa spiralis of the goat colon.**—*Anat. Anz.* 106, 101-103. [In English.] 1610

The pattern of the ansa spiralis was irregular in 6 of 50 goats. In the 44 goats with a regular pattern the number of centripetal coils varied from  $2\frac{1}{2}$  to  $3\frac{1}{2}$ . It is suggested that the variations are due to crossbreeding.

—M.G.G.

Val'dman, V. A. (1959). **[Reflex influences from the mammary gland acting on the digestive system of goats.]**—*Sechenov J. Physiol.* 45, 1372-1377. [In Russian.] 1611

Reflex regurgitation occurred between 2 and 16 sec. after commencement of milking in goats during the beginning of lactation and between 7 and 25 sec. towards the end of lactation. Receptors in the teats were responsible for this reflex. Increase in intramammary pressure without stimulation of exteroceptors did not provoke the reflex. The afferent route of the reflex passed through the dorsal roots in the lumbar region and the ipsilateral dorsal funiculus of the spinal cord.

—R.M.

Dedashev, Y. P. (1959). **[Influence of conditioned reflexes mediated by exteroceptors or interoceptors on motor activity of the rumen and reticulum of sheep.]**—*Sechenov J. Physiol.* 45, 1259-1262. [In Russian.] 1612

Electric shocks applied to skin of the metatarsus by means of an induction coil were followed by a reduction in the relative number of contractions of the rumen compared with those of the reticulum. By ringing a bell at each shock, a conditioned reflex was established whereby the change in contractions occurred after the bell stimulus without electric shock. A similar reflex was established by dilating the rectum with a balloon (interoceptive stimulus).—R.M.

Mayer, S., Maickel, R. P., Brodie, B. B. (1959). **Kinetics of penetration of drugs and other foreign compounds into cerebrospinal fluid and brain.**—*J. Pharmacol.* 127, 205-211. 1613

The authors concluded that drugs such as thiopentone, barbitone, salicylate and antipyrine entered the central nervous system by a process of simple diffusion; that there was no demonstrable barrier to the passage of drugs highly soluble in fats; and that for foreign compounds the blood-cerebrospinal fluid and blood-brain barriers were similar if not identical.—R.M.

Dellmann, H. D. (1959). Beitrag zur Kenntnis des Hypothalamus - Hypophysen - Systems beim Rind. II. Mitteilung. Morphologische Untersuchungen am Hypothalamus-Hinterlappen-System. [The hypothalamus-pituitary system in cattle. II. Morphology of the hypothalamus-posterior pituitary system.]—Anat. Anz. 107, 230-251. 1614

Using sections of the hypothalamus of 18 cattle, D. studied the secretory nuclei of the hypothalamus and the topography and morphology of the fibres of the hypothalamus-posterior pituitary system.—M.G.G.

Smith, R. N., Allcock, J. (1960). Epiphysial fusion in the greyhound.—Vet. Rec. 72, 75-79. [Authors' summary.] 1615

An analysis is presented of the changes shown by radiology which are undergone by each joint in the fore- and hind-limbs of developing greyhounds. It is pointed out that complete fusion of the epiphyses is the easiest stage to recognise, but this is not necessarily coincident with cessation of longitudinal growth.

Lascelles, A. K. (1959). The time of appearance of ossification centres in the Peppin-type Merino.—Aust. J. Zool. 7, 79-86. [Abst. from author's summary.] 1616

68 foetuses of known age were examined and measured using radiological methods. Analyses of the results show that body length, tibial length, or osseous maturation measurements are of equal value in assessing the age of the foetus.

Hofmann, R. (1960). Die Gefässarchitektur des Bullenhodens, zugleich ein Versuch ihrer funktionellen Deutung. [Vascularization of bulls' testicles and its functional significance.]—Zbl. VetMed. 7, 59-93. [Summaries in English, French and Spanish. English summary modified.] 1617

Using plastic and latex preparations the course and distribution of the internal spermatic artery and vein were described. Their structure was studied histologically and the

nomenclature of this vascular area was discussed.

The lymph vessels of the testis and spermatic cord were also described. By means of experiments with models and with fresh testicles it was possible to demonstrate slowing of the blood stream, maintenance of the pulse wave in the internal spermatic artery and the promotion of venous drainage by pulsation of the artery. A functional relationship of the vascular arrangement to temperature and pressure influences was discussed.

Smith, A. H., Court, S. A., Martin, E. W. (1959). Formation of albumen precursors by the hen's oviduct.—Amer. J. Physiol. 197, 1041-1044. 1618

The chemical composition of the oviduct magnum (albumen-forming segment) was determined before and after deposition of albumen around the yolk, and in non-ovulating hens. The results indicated that albumen precursors were formed in at least two stages. Nearly half appeared to be synthesized and transferred at the time of deposition.—R.M.

Fitzpatrick, R. J. (1960). The reactivity of the ruminant uterus to posterior pituitary hormones.—J. comp. Path. 70, 36-58. [Author's conclusions modified.] 1619

The reactivity of the bovine myometrium to oxytocin was investigated. In the non-pregnant animal responses are augmented by treatment with stilboestrol. In pregnancy reactivity is low, but develops suddenly to a high magnitude for a brief period at about the time of parturition.

Vasopressin has an inherent uterine stimulating activity in cows. Variation in uterine response is similar to that with oxytocin but augmentation by oestrogen is less. Augmentation of response at parturition is less than with oxytocin but extends over a longer period. Similar reactions occur with oxytocin and vasopressin in pregnancy and parturition in sheep.

The results are discussed in relation to the secretion of sex hormones and to the inherent activity of vasopressin. The present method of standardizing Pituitary (Posterior Lobe) Extract of the British Veterinary Codex is criticized. The use of unfractionated pituitary extracts is considered dangerous and unreliable and the current recommended dosage of preparations containing oxytocin is criticized as being far too high.



Grosvenor, C. E., Turner, C. W. (1960). **Pituitary lactogenic hormone concentration during pregnancy in the rat.**—*Endocrinology* 66, 96-99. 1620

During the first two-thirds of pregnancy, during which time there was little or no evidence of secretory activity by the mammary gland, lactogenic hormone content of the pituitary gradually increased and reached a peak by the 16th day. In association with the progressive increase in secretory activity of the mammary gland during the last third of pregnancy there was a rapid decline in pituitary lactogenic hormone in the pituitary.

These data suggest that a progressive accumulation of lactogenic hormone occurs during the period of mammary gland development. The hormone then is discharged during the latter part of pregnancy to initiate secretory activity of the mammary gland alveoli.

—R.M.

Hayashida, T., Choh Hao Li (1959). **A comparative immunological study of pituitary growth hormone from various species.**—*Endocrinology* 65, 944-956. [Abst. from authors' abst.] 1621

The antigenic structures of pituitary growth hormone from man and monkeys are very similar, but are clearly different from those of whale, pig, sheep, ox, horse and fish; furthermore, the antigenic structures of sheep and ox hormone are closely related, but quite different from those of all other species tested.

Godfrey, N. W., Tribe, D. E. (1959). **Thyroxine and wool growth.**—*J. Dep. Agric. Vict.* 57, 767, 769 & 771. 1622

Using Corriedales and a Suffolk × Border Leicester/Merino cross, trials were conducted to determine whether the implantation of thyroxine would increase the rate of sheep maintained on poor quality roughage.

Treated sheep on a restricted diet of hay yielded 12% more wool than untreated sheep on the same diet. There was no apparent difference between treated and untreated sheep on an unrestricted diet of hay. Thyroxine depressed live weights by about 10%. It did not affect the wool fibre diameter.

Comparisons are drawn between the breeds.—A. CULEY.

Reaven, G., Schneider, A., Reaven, E. (1959). **Effect of parathyroid extract on in vitro uptake of  $\text{Ca}^{45}$  by voluntary muscle.**—*Proc. Soc. exp. Biol., N.Y.* 102, 70-71. [Authors' summary modified.] 1623

Parathyroid extract consistently inhibited uptake of calcium by rat voluntary muscle. This observation is compatible with the known hypercalcaemic effect of parathyroid hormone and with the hypothesis that parathyroid glands regulate movement of Ca between extracellular and intracellular fluid.

Biggs, P. M., Payne, L. N. (1959). **Cytological identification of proliferating donor cells in chick embryos injected with adult chicken blood.**—*Nature, Lond.* 184, Suppl. No.20 p. 1594. 1624

Male cells were found in the enlarged spleen of all 15 female chick embryos that had been inoculated i/v with citrated cockerel blood 4 days previously at 14 days of incubation. The high proportion of female cells, however, suggested that much of the enlargement was due to embryo cells.—M.G.G.

McCully, K. A., Maw, W. A., Common, R. H. (1959). **Zone electrophoresis of the proteins of the fowl's serum and egg yolk.**—*Canad. J. Biochem. Physiol.* 37, 1457-1468. [Authors' summary modified.] 1625

In addition to the six protein fractions distinguishable in sera from cocks or sexually immature pullets by zone electrophoresis in aqueous veronal, two lipoprotein zones were distinguished in sera from laying hens or oestrogen-treated pullets. Phosvitin was detected in serum of oestrogen-treated hens by zone electrophoresis of a saline solution of crude serum lipovitellin obtained from the serum. Six protein zones were distinguished in similar electropherograms of egg yolk. The two major lipoprotein zones from egg yolk were closely similar to, or identical with, the two lipoprotein zones from sera of laying hens of oestrogen-treated pullets. The status of a seventh minor protein zone in electropherograms of yolk protein was uncertain.

## PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

Skaggs, S. R., Miller, D. D. (1959). **Penicillin levels in milk due to oral intake by dairy cows.**—*Res. Rep. New Mexico agric. Exp. Sta.* No.27 pp. 6. [Authors' summary modified.] 1626

No penicillin was transmitted to the milk of cows fed 88.9 mg. of procaine penicillin daily, the amount recommended for bloat control. When this rate was doubled, an appreciable amount of penicillin, sufficient to inhibit

the growth of lactic cultures used in fermented milk and cheese making, was transmitted to the milk.

Tikhonin, I. Y., Fel'dshtein, M. A., Mart'yanov, S. N., Zel'manov, I. S., Romandina, V. P. (1959). **[Losses to the meat industry caused by concealed injuries to livestock.]—Veterinariya, Moscow 36, No.9 pp. 49-51. [In Russian.] 1627**

At the Moscow abattoir between 0.08 and

2.7% by weight of carcasses was judged unfit for human consumption because of haemorrhages, oedema, necrosis and fibrosis of muscle caused by traumatic injuries.—R.M.

Dobbelaar, M. J. (1960). **The Central Animal Laboratory.**—Tijdschr. Diergeneesk. 85, 149-163. [In English. Summaries in French, German and Dutch.] 1628

Description of the plan, construction and operation of a new building for lab. animals at the medical faculty at Nijmegen.—R.M.

See also absts. 1333 (salmonella in foods for man and animals); 1358 (salmonella in meat and fish meal); 1359 (salmonella and Cl. welchii in meat); 1489 (cysticercus in the porcine brain).

## REPRODUCTION AND REPRODUCTIVE DISORDERS

McCartney, M. G., Chamberlin, V. D., Carter, R. D., Wyne, J. W. (1959). **Factors affecting the artificial insemination of turkeys.**—Res. Cir. Ohio agric. Exp. Sta. No.76 pp. 19. [Authors' summary modified.] 1629

The relation of frequency of insemination and semen dosage to fertility was studied over 3 years, using three varieties of turkeys. In general, inseminations at 2-week intervals tended to result in better fertility, hatchability and average poult production than inseminations at less frequent intervals.

There was no evidence that fertility, hatchability and poult production were affected by variations in the dose of semen: 0.01 ml. of undiluted pooled semen was as good as 0.05 ml.

The Bronze variety had poorer fertility, hatchability and poult production than the Large and Small White varieties.

Semen stored at 60°F. had better fertilizing capacity than at 50°F., but there was a sharp drop in fertility when it was stored at either temperature for two hours.

Koefoed-Johnsen, H. H. (1960). **Influence of ejaculation frequency on the time required for sperm formation and epididymal passage in the bull.**—Nature, Lond. 185, 49-50. 1630

In experiments on 3 bulls, whose spermatozoa were labelled with P<sup>32</sup>, it was observed that: frequency of ejaculation did not affect the formation of spermatozoa and their passage into the epididymis; the average age of spermatozoa varied with frequency of collection—infrequent collections resulted in a higher average age.—T.E.G.R.

White, I. G., Larsen, L. H., Wales, R. G. (1959). **Method for the in vivo collection of epididymal spermatozoa and for their comparison with ejaculated cells.**—Fertil. &

Steril. 10, 571-577. [Authors' summary modified.] 1631

A unilateral fistula of the vas deferens was created in rams so that on electrical stimulation both epididymal and ejaculated spermatozoa were obtained.

Macpherson, J. W., Vesselinovitch, S. D. (1959). **Electrophoresis of bovine semen. IV. Sex ratio in cattle resulting from electrophoretically treated semen.**—Canad. J. comp. Med. 23, 375-376. [Summary in French. Authors' summary modified.] 1632

Bovine semen samples after dilution were fractionated electrophoretically and used for artificial insemination. A total of 247 calves were born and the resulting sex ratio was determined for the anodic, cathodic and central fractions. No consistent deviation of the sex ratio from the 0.5 value was observed. The need for further investigation is suggested.

Polge, C., Jakobsen, K. F. (1959). **Techniques for freezing bull semen.**—Vet. Rec. 71, 928-932. 1633

A method of freezing bull semen is described. Immediately after collection it is diluted with a yolk-citrate buffer containing 7.5% glycerol, distributed into ampoules at room temp., cooled to 2°C., equilibrated at that temp. for 7-8 hours, and frozen by placing directly into crushed solid CO<sub>2</sub>. The fertility of semen frozen by this method will be reported later.—M.G.G.

Rothschild (1959). **Anaerobic heat production of bull spermatozoa. II. The effects of changes in the colligative and other properties of the suspending medium.**—Proc. roy. Soc. Ser. B. 151, 1-22. 1634

Between the range 7.4 and 6.9, pH had almost no influence on the rate of heat pro-



duction, but at pH 6.4 it was almost halved. Hypertonic media had almost no effect on the rate of heat production, but it was depressed by hypotonic media, although adaptation occurred, and the depressant effect was not as great as that caused by change in pH. The rate of anaerobic heat production declined before substrate exhaustion or reduction in pH of the medium were likely to have any effect on sperm metabolism. Reasons for this were discussed.—R.M.

Rao, S. S., Sadri, K. K. (1960). **The antigenic composition of buffalo semen.**—J. comp. Path. 70, 1-9. [Authors' conclusions modified.] 1635

The antigenic composition of buffalo semen was studied using the Ouchterlony gel diffusion technique. The seminal plasma contained at least 16 antigens and spermatozoa at least 7, of which 4 were common to both.

Prostatic secretion contained 4 antigens common to semen and to blood serum. Seminal vesicle and ampullar secretions had 5 and 3 antigens respectively in common with semen. Two of the antigens of the seminal vesicular secretion, were common to spermatozoa and 2 to ampullar secretion. Six antigens of the blood serum were common to seminal plasma and 4 to cervical mucus. The results indicated that antibodies circulating in the blood could also be present in cervical mucus.

King, T. E., Mann, T. (1959). **Sorbitol metabolism in spermatozoa.**—Proc. roy. Soc. Ser. B. 151, 226-243. 1636

The concentration of sorbitol was determined in seminal plasma from stallion, bull, ram, boar, rabbit, cock and man. Ram spermatozoa oxidized sorbitol to fructose with the aid of sorbitol dehydrogenase. This enzyme was isolated from ram spermatozoa and its properties were studied.—R.M.

Dow, C. (1960). **Ovarian abnormalities in the bitch.**—J. comp. Path. 70, 59-69. [Author's conclusions modified.] 1637

Histological examination of the ovaries of 400 bitches, submitted for P.M. examination, revealed tumours in 25, secondary tumours in 3 and benign cysts in a further 90. D. described the histology of the lesions and recorded their secretory activity with regard to mucin and lipid. The age incidence suggests that both tumours and cysts are more common after the age of 5 years and in nulliparous animals.

Hafez, E. S. E. (1959). **Tuboovarian mechanisms and ova reception in mammals. A comparative study.**—Cornell Vet. 49, 459-478. 1638

This is a review of 84 papers selected from a larger literature and based largely upon human and rodent material. It is claimed [unconvincingly] that "there are no species differences in the activity of the tube". Tubal secretions pass into the abdominal cavity rather than the uterus. Muscular action is under hormonal influence; cyclic variation in contraction is related to degree of vascular enlargement. Few sedatives but notably pentobarbitone sodium, affect the contractions in human subjects. Pick up of ova appears to be affected mainly by morphological approximation aided by ciliary currents and those due to absorption of luminal fluid into the lymphatic system.—F. L. M. DAWSON.

Axelrod, L. R. & Werthessen, N. T. (1960). **Metabolism of estrone-16-C<sup>14</sup> in bovine blood.**—Arch. Biochem. 86, 53-55. 1639

When labelled oestrone was incubated with blood from pregnant cows, oestradiol-17 alpha was the chief metabolite.—R.M.

Velle, W., Erichsen, S. (1960). **Studies on oestrogens in cattle. Conversions of oestrogens by bovine kidney cells in vitro.**—Acta endocr., Copenhagen 33, 277-286. [In English.] 1640

Tissue cultures were employed in order to exclude the effect of blood or serum on oestrogen transformation. In cultures of kidney cells oestrone was converted to oestradiol-17 beta, and both alpha and beta forms of oestradiol-17 were converted to oestrone. These conversions did not take place in control media devoid of cells.—R.M.

Gassner, F. X., Martin, R. P., Shimoda, W., Algeo, J. W. (1960). **Metabolism of radio-active steroid esters in the bovine male and female.**—Fertil. & Steril. 11, 49-73. 1641

The authors determined residues of stilboestrol, testosterone, testosterone enanthate and 17-hydroxyprogesterone caproate in liver (obtained by biopsy), muscle and blood, urine and faeces of cattle after subcutaneous injection with the aid of steroids labelled with radiocarbon.—R.M.

Velle, W. (1959). **Isolation of oestrone from the urine of the pregnant sow.**—Acta vet. scand. 1, 19-26. [In English. Summaries in German and Norwegian. Author's summary modified.] 1642

Oestrone in the urine of sows in late pregnancy was demonstrated by chromatographic and spectrophotometric methods.

Using the method of Brown (1955) for chemical determination of urinary oestrogens, small amounts of oestrone were also detected in urine of non-pregnant sows. A considerable increase in the concentration of oestrone was regularly observed in urine specimens from sows 25 to 30 days pregnant. A simplified Brown method could therefore be used for early pregnancy diagnosis in this species.

No significant amounts of oestriol and oestradiol were detected in the urine from non-pregnant and pregnant sows by the Brown method.

Dabash, A., Sharaf, A. (1959). **The response of canine endometrium to various hormones and related compounds.**—*J. Physiol.* 148, 465-468. [Authors' summary modified.] 1643

The action of steroid sex hormones and some related compounds on the endometrium of ovariectomized bitches treated with oestradiol was investigated. Progestational proliferation reactions were produced with progesterone, deoxycortone and pregnenolone when given in a dose of 1 mg. daily for 5 days. Ethisterone and testosterone failed to produce such progestational effects when used in the same doses; testosterone produced some progestational effect only when used in doses of 4 or 5 mg. daily for 5 days.

Ingram, D. L. (1959). **The effect of gonadotrophins and oestrogen on ovarian atresia in the immature rat.**—*J. Endocrin.* 19, 117-122. [Author's summary.] 1644

Immature female rats were treated with either gonadotrophin or oestrogen and an estimate was made of the number of medium-sized follicles in which the oocyte had begun its first maturation division. It was found that fewer follicles had become atretic after division of the oocyte in the experimental animals than in the controls.

Revesz, C., Chappel, C. I., Gaundry, R. (1960). **Masculinization of female fetuses in the rat by progestational compounds.**—*Endocrinology* 66, 140-144. [Authors' abst.] 1645

Progesterone, 17  $\alpha$ -ethynyl-19-nortestosterone, and 6  $\alpha$ -methyl-17  $\alpha$ -acetoxy progesterone were administered to pregnant female rats and the newborn were examined at birth and at 20 days for evidence of masculinization. Progesterone caused no abnormalities but both synthetic compounds produced pseudohermaphroditism.

Campbell, E. A. (1960). **Effects of estrogen on blood volume and hemoglobin in immature pullets.**—*Amer. J. Physiol.* 197, 1181-1182. 1646

Blood volume was determined in pullets aged 14-16 weeks before and after administration of 6 doses each of 3 mg. oestradiol benzoate given over 14 days. Results showed that oestrogen increased plasma volume. It was suggested that this mechanism was responsible for the fall in haemoglobin content of blood which occurs when pullets come into lay.

Rankin, J. E. F. (1959). **Abortions in heifers which had been fed silage containing hexoestrol.**—*Vet. Rec.* 71, 924-926. [Author's summary modified.] 1647

An account is given of a series of abortions in heifers with evidence that the agent responsible was hexoestrol with which their silage ration had become contaminated. Tests for the usual infectious causes of abortion proved negative. The contamination of silage resulted from sealing a silo pit with dung from hexoestrol-fed bullocks. The hexoestrol persisted in the dung for a period of between 9 and 12 months.

Paterson, J. S., Brimblecombe, R. W. (1959). **Hexoestrol contamination of mouse and rat cubes.**—*J. Anim. Tech. Ass.* 10, 126-128. 1648

Two weeks' feeding with cubes contaminated with hexoestrol caused infertility for 8 weeks, abortion and absence of milk in adult mice, persistent oestrus in young mice and temporary sterility in adult rats. The hormone content of the cubes was determined, in ovariectomized rats, to be equivalent to 1.32-3.18 g. stilboestrol per ton. It is concluded that lab. animal diets should not be made on premises where hormone preparations are used.

—M.G.G.

Jeganathan, P. (1959). **The use of progesterone in functional infertility in dairy cows.**—*Ceylon vet. J.* 7, 2-5. 1649

11 of 18 cows with prolonged infertility histories (average about 12 services) and exhibiting suppression of oestrus after mating, conceived when service was followed, between 3-7 days, by intramuscular injection of oily progesterone. Dosage was staggered at 48-hour intervals and varied from 50-200 mg., 12 animals receiving 100 mg. No untreated controls were left.—F. L. M. DAWSON.

Nijhof, W. J. (1959). **Yatren-vaccin en steriliteit van rundvee.** [**Treatment of bovine steril-**



ity with "Yatren".]—Tijdschr. Diergeneesk. 84, 1316-1324. [In Dutch.] 1650

Details are given of 184 infertile cows subjected to "non-specific stimulation therapy" in the form of one or two injections of "Yatren" vaccine. 157 subsequently became pregnant, 116 after the first insemination after treatment. 21 had been inseminated without success three or more times: 14 became pregnant after treatment, all after the first insemination. There were no untreated controls.—R.M.

Blackwell, R. L., Knox, J. H., Cobb, E. H. (1959). **A hydrocephalic lethal in Hereford cattle.**—J. Hered. 50, 143-148. 1651

Affected calves were either stillborn or died soon after birth. The skull was dome-shaped, teeth development incomplete. Some births were accompanied by excessive amounts of amniotic fluid. From the herd history it was concluded that the condition was due to a single, autosomal, recessive gene.—E.G.

See also absts. 1305 (corynebacterial abortion in sheep); 1306 (role of *Corynebact. pyogenes* in bovine sterility and puerperal diseases); 1316 (*Ps. pyocyanea* in prepuce and semen of bulls); 1328 (*S. dublin* infection in a lambing flock); 1329 (role of male in incidence of salmonella abortion in ewes); 1338 (porcine brucella abortion); 1355 (bovine vibriosis); 1424 (chronic interstitial orchitis in bulls); 1590 (hypoxia in foetal sheep); 1591 (egg shell changes during incubation); 1593 (periodic acid-Schiff material and alkaline phosphatase in uterine wall of pigs during sexual cycle); 1604 (blood pressure before and after calving); 1605 (vascular responses in rats during reproductive cycle); 1617 (vascularization of bulls testes and its functional significance); 1618 (albumen precursors in hen's oviduct); 1619 (reactivity of ruminant uterus to posterior pituitary hormones); 1620 (pituitary lactogenic hormone concentration in pregnant rats); 1663-1666 (reports, Nyasaland).

## ZOO TECHNY

Burns, M. A. (1959). **Judging the ages of cattle by their teeth—new data.**—Qd agric. J. 85, 531-536. 1654

Observations in Hereford cattle grazing on native pastures in Queensland have shown that eruption of permanent incisors is not a reliable guide to their age. For females, the first pair of incisors erupted between 22 to 34 months of age, the second pair 29 to 41 months and the third pair 35 to more than 42 months. Corresponding data for males were 22 to 27, 27 to 34 and 33 to 41 months of age respectively.—M. C. FRANKLIN.

Landauer, W. (1959). **A lethal mutation in Dorking fowl.**—J. Hered. 50, 137-139. 1652

L. described a recessive lethal factor in Dorking fowls, causing embryonic death on the 8th-9th day of incubation, characterized by reduced body and neck size, malformation of the beak and heavily pigmented eyes.

—E.G.

Miller, V. L., Bearse, G. E., Hammermeister, K. E. (1959). **Mercury retention, a trait of chickens.**—Poult. Sci. 38, 1037-1039. [Authors' summary modified.] 1653

Differences in phenylmercuric acetate retention in strains of chickens selected for leucosis resistance and susceptibility and their reciprocal crosses were noted. The first generation cross chicks resembled the parent that retained mercury poorly (S strain) more closely than they did the one retaining large amounts of mercury (R strain). There was no significant difference between sexes in mercury retention.

Anon. (1959). **Recommendations for the carriage of live animals by air. Monkeys for laboratory use (up to 10 lb).**—London: British Standards Institution. B.S. 3149, Pt. 1. pp. 11. 4s. 1655

A travelling cage of wood and galvanized wire mesh is depicted, measuring 36 × 18 × 19 inches. It will hold up to 12 monkeys with a combined weight of not more than 50 lb. Recommendations are made on quarantine and treatment before departure, and on ventilation, temp., light, food, water, hygiene, equipment and personnel required during flight. A certificate of fitness should accompany each consignment.—M.G.G.

## TECHNIQUE AND APPARATUS

Hunter, J. R. (1959). **Photographic recording of agar diffusion plates.**—Nature, Lond. 183, 1283-1284. 1656

The apparatus, which is described in detail, is compact and stable and so designed that a beam of transmitted light is as nearly as possible at right angles to the agar surface,

without the source of light being visible to the eye or lens. This produces maximum visual and photographic contrast between the lines of precipitation and the background.—T.E.G.R.

Sadek, F. S., Reilley, C. N., Hill, C. (1959). **A survey on the application of visual indica-**

tors for the chelometric calcium determination in serum.—J. Lab. clin. Med. 54, 621-629. 1657

The authors discussed the accuracy of chelometric methods (methods using ethylenediamine tetra-acetic acid as a chelating agent) and compared several metallochromic indicators which enabled visual estimation of calcium to be made within 2-5 min.—R.M.

Cook, R. (1959). Frequency at which blood can be drawn from farm animals.—J. Anim. Tech. Ass. 10, 129-134. 1658

For 6 months 30 litres of blood were taken weekly from 9 horses by collecting one quarter of the calculated blood volume of each horse every third week. No effect on blood values was found and health remained excellent. In 2 horses from which  $\frac{1}{4}$ – $\frac{1}{2}$  of the total blood was removed within a week, the quantities of r.b.c. and haemoglobin and packed cell volume did not return to normal until 4-6 weeks later, whereas the blood volume was normal after 3-6 days. Six-month-old calves from which a quarter of the blood was removed at fortnightly intervals until the age of 12-15 months showed no signs of stress and clinically were indistinguishable from control calves.—M.G.G.

Mange, A. P., Stone, W. H. (1959). A spectrophotometric technic for measuring erythro-

cyte chimerism in cattle.—Proc. Soc. exp. Biol., N.Y. 102, 107-110. [Authors' summary modified.] 1659

An easily performed and precise method for measuring degree of erythrocyte chimerism in cattle is presented. A spectrophotometer is used to measure transmittance of solutions containing haemoglobin of those cells remaining after differential haemolysis by appropriately chosen reagents.

Johnson, T. M., Garvin, J. E. (1959). Separation of lymphocytes in human blood by means of glass wool column.—Proc. Soc. exp. Biol., N.Y. 102, 333-335. [Authors' summary.] 1660

The method of differential adsorption has been successfully applied to separation of lymphocytes from granulocytes in human blood. When whole blood was passed through a short column of siliconized glass wool, the granulocytes were almost quantitatively retained on the column, and uninjured lymphocytes in 30-89% yield appeared in the effluent blood.

Duthie, I. F. (1959). A sheep metabolic cage for mineral balance and radio-isotope experiments.—Lab. Pract. 8, 408-411 & 414. 1661

Construction details are described and illustrated.—R.M.

See also absts. 1311 (continuous culture of *Past. multocida*); 1335 (novobiocintetrathionate broth medium for isolation of *Salmonella* from faeces).

## REPORTS

Australia. (1958). Tenth annual report of the Commonwealth Scientific and Industrial Research Organization for the year 1957-58. pp. 174. Canberra: A. J. Arthur, Commonwealth Govt. Printer. 14s. 1662

VIBRIOSIS is a serious cause of infertility in dairy herds in Victoria and TRICHOMONIASIS is less important. In Tasmania vibriosis has been diagnosed in a number of herds. *Brucella ovis* infection was more readily set up by injection into the teat canal than by i/v or ocular inoculation. Only when injected into the testis or epididymis did *Br. abortus* Strain 19 become established in the genital organs of rams. *Fusiformis nodosus*, the cause of CONTAGIOUS FOOT ROT, grows well in ground sheep horn in lemco agar, also in acid hydrolysed horn plus "Difco" trypsin. A selective medium has been devised for *F. necrophorus*. Experimental MYCOTIC DERMATITIS lesions have been produced for

testing curative agents but no promising compounds have yet been found. Tail-tip inoculation with concentrated suspensions of formal killed BOVINE CONTAGIOUS PLEUROPNEUMONIA organisms conferred considerable resistance to challenge. Genetic factors are not important in susceptibility to bad tail reactions to living vaccine. Joint and heart lesions occur in young calves after tail inoculation and also after i/v inoculation. Progress has continued on freeze-drying of vaccine; recoveries of about 10% after reconstitution were common. Growth of the organism in chick embryos was studied and a trial of Piercy's "egg vaccine" gave encouraging results. The dried vaccine had good keeping quality, but after reconstitution it was heat labile. An indirect haemagglutination test was developed for measuring antibody and antigen. A non-pyrogenic polysaccharide was isolated from the organism; it sensitized r.b.c. to this test



in high dilution.

The life history of *Babesia bigemina* in the tick, and in cattle, is being studied. Larvae become infected, and infection is transmitted either by adults from those larvae, or by their larval progeny. Nymphs which have fed on an infected animal have not yet infected normal or splenectomized calves. The blood of one of 11 calves less than 7 days old contained *B. bigemina*. All had *Anaplasma marginale*, only two had *Theileria mutans*. 24 out of 57 adult cattle have shown *Th. mutans* at one or more samplings.

Temperatures from 33° to 36°C. were optimum for *Linognathus pedalis*. Skin temperatures of the limbs of sheep are very variable and may be below the optimum for *L. pedalis*. Diurnal fluctuations in activity of BLOWFLIES show remarkable parallels to variation in abundance with season. Most species became scarce during a long dry period in January and February; but after rain, increase was too rapid to be accounted for by local breeding. Flies re-invaded from habitats where they had been sheltering during the drought. Adult *Chrysomya rufifacies* emerge from carcasses until late autumn, when temperature permits. In a small trial on control of CATTLE TICKS by resting the pastures, heavy infestations built up on cattle when run on a continuously grazed pasture after previously grazing only on rested pastures. However, because of their virtual freedom from ticks in the previous year, these cattle remained larger and heavier than cattle formerly grazed continuously on infested pastures. When the herd formerly grazed continuously was introduced into the rested pasture system their infestations dwindled. In a large trial in Queensland 450 cattle were confined to one paddock during the wet season (summer), and then divided between two rested paddocks during the drier months (winter). They were dipped in January, April, July (for lice) and October, and ticks were controlled very effectively. When larvae of *Ixodes holocyclus* and *Boophilus microplus* were released in lantana thicket and grassland the former migrated down to the soil (where their rodent and bandicoot hosts live) and the latter migrated upwards as high as 5 ft. The difference in numbers of female *B. microplus* on individuals of the *Bos indicus* breeds was not associated with any marked skin hypersensitivity reaction, and appeared to be due partly to the inherent individual susceptibility or resistance. Three of six animals developed

some degree of skin hypersensitivity (to i/d injection of larval antigen) and slight reaction after attachment of the nymphs and adults. Ticks with a low-order resistance to DDT have been detected on another Queensland property. They could still be controlled with 0.5% pp/-DDT. Of 6 strains of cattle ticks from N.S.W. where the eradication campaign failed, 5 were completely DDT-susceptible, and one had a negligible degree of DDT tolerance. DDT-resistant ticks subjected to ten months' dipping with BHC and four months with dieldrin became resistant to dieldrin, and retained their former degree of DDT resistance. A DDT-resistant strain reverted to a low-order resistance, and a dieldrin-resistant strain reverted to almost complete susceptibility during culturing for 14 and 8 generations respectively. Samples from well-used DDT dips proved more toxic than lab. preparations of the same concentration. One freshly charged DDT dip, in which the hardness of the water necessitated chemical softening, had a very low toxicity, but with a sample from the same dip after about a year of use toxicity had increased. DDT-treated ticks exposed in the field at monthly intervals produced less progeny than untreated ticks, and failed to lay eggs between April and September. Persistence of diazinon was related to coat density. Winter coats of cattle may retain an effective deposit ten times longer than short summer coats. Formulation affects the size of the DDT deposit left on the coats of cattle, but not the persistency of effective deposits. A mixture of 0.5% pp/-DDT and 0.05% diazinon gave effective tick control. A bioassay technique showed no synergic action between diazinon and DDT. Bayer "21/199" tested in a dip as a wettable powder at 0.05% was highly toxic to cattle ticks, afforded a protective period of 4-7 days, and was stable. No significant difference was found in specific cholinesterase activity of r.b.c. or of diaphragm homogenates between mice paralysed by *Ixodes holocyclus* and controls. *Haemaphysalis bispinosa* commonly develops parthenogenetically and males are rare. In field trials, 0.2% arsenic controlled *Psorergates ovis*, whereas 0.025% and 0.05% diazinon failed.

*Simlimnea subaquatilis*, intermediate host of *Fasciola hepatica*, can complete one generation in one month. Eggs can hatch in five days and the resulting snails can produce eggs in 27 days. Oviposition is not restricted to any one season. Snails may aestivate in dried mud

for at least 77 days. The maximum number of eggs recorded from a single snail in one month was 239. Egg masses were killed by both copper sulphate and copper pentachlorophenate (10 p.p.m.) after exposure for 15 min. Copper pentachlorophenate is more effective against *S. subaquatilis* than copper sulphate. The snails can survive dry periods for some months, and spraying is best carried out when there is ample surface water. The intramuscular injection of carbon tetrachloride appears to be a safe and effective therapy for FASCIOLIASIS in cattle. Sheep grazing dry pastures were dosed with phenothiazine after 24 hours without water, with no ill-effects. Phenothiazine with 90% of particles less than  $10\mu$  was less effective against *Ostertagia* spp. than against *Trichostrongylus colubriformis* in sheep. Bayer L13/59 ("Neguvon", "Dipterex") at 2.5 g./100 lb. body wt. was usually highly effective against *Haemonchus contortus*, but occasionally there was only a temporary reduction in worm egg count. 5 g. into the abomasum was effective against *T. colubriformis*, but 10 g./100 lb. body wt. into the rumen was ineffective. Efficiency against *Oesophagostomum columbianum* was variable even at dose rates fatal to some sheep. Weaner lambs were given 2.5, 5, and 10 g. per 100 lb. body wt. by inj. into the rumen, and by mouth after swabbing with 10% copper sulphate solution; no ill-effects were seen after 2.5 or 5 g./100 lb. by mouth, but 10 g./100 lb. was rapidly fatal in two of ten sheep and toxic for three others. The 10 g. dose inj. into the rumen was not toxic. Bayer 21/199 ("Muscatox") was highly effective against *H. contortus*, *T. colubriformis*, *T. axei* and *Oe. columbianum*, but very toxic. Dow ET-57 ("Trolene") was less effective. Oil of mustard had anthelmintic activity but was toxic at 0.75 ml. Copper methyl arsenate is very effective against *Moniezia* spp., but safe doses were only slightly effective against *H. contortus* and *Oe. columbianum*. Di-(N-benzyl-N, N-dimethyl-N-2-phenoxy-methyl-ammonium)-3-hydroxy-2-naphthoate was very effective against *H. contortus* and *Oe. columbianum* when injected into the rumen, but not against *T. colubriformis* unless given into the abomasum. Butyl-N-phenyl thiocarbamate showed anthelmintic activity against *T. colubriformis* (8 g./100 lb. body wt. into the rumen). 3, 3-diethylthiadiazine iodide showed fair efficiency against *T. colubriformis* (9 g./100 lb. into the rumen). Papain, dosed into the abomasum, was un-

successful against *T. colubriformis*. Doses of 0.1 g. promethazine hydrochloride or 0.15 g. diethylamine-N-phenothiazine hydrochloride into the rumen were not effective against *T. colubriformis*. In tests against the oxyurid worms of mice, Bayer "L13/59" was highly effective at 0.5 g./kg. body wt. Pyridine was effective at 0.25 g./kg. but killed two of six mice. Phenothiazine of very fine particle size (50% less than  $2\mu$ ) at 2 g./kg. gave the lowest efficiency yet experienced with this compound. Daily doses (0.5 g.) of piperazine did not prevent establishment of larvae of *Oe. columbianum* in intestinal nodules or subsequent development of adult worms. Vitamin A given to sheep with low plasma levels did not affect their susceptibility to *T. colubriformis*. A method has been developed to recover and count larvae from rumen contents. Eggs of *Ostertagia* spp., *T. axei* and *T. colubriformis* withstood storage at 4°C. for 168 hours; eggs of *H. placei* were dead after 24-48, *H. contortus* at 96, and *Oe. columbianum* at 48-72 hours. A technique has been evolved to differentiate first stage larvae of sheep nematodes. Repeated treatment with phenothiazine did not interfere with development of resistance to *T. colubriformis*. The direct sensitizing ability for r.b.c. of various fractions of *H. contortus* larvae was investigated, but none was satisfactory. Sensitization of tanned r.b.c. with antigen allowed a haem-agglutination test to be used in parallel with the c.f. test. No constant relationship exists between the results of the two tests. Agar gel diffusion tests to study the antigens of *H. contortus* and *T. colubriformis* larvae revealed a qualitative difference between these species. The antigens of excretory products and exsheathing fluid of larvae are present in antigens prepared from whole larvae. Infective larvae of some ovine trichostrongylids exsheathe in the rumen, but there is no evidence that exsheathement is stimulated by a specific substance. A wide range of substances can influence it, e.g. sodium chloride, calcium chloride, and acetic acid, but only under specified physical conditions. Oxidation-reduction potentials appear to act directly on the larvae, possibly conditioning some centre in the posterior half of the oesophagus. No difference in the degree of infestation with *H. placei* or its persistence could be detected in calves infested with pure *H. placei*, or with mixed infestations of *H. placei*, *Trichostrongylus axei*, *Cooperia pectinata*, *C. punctata*, *Oesophagostomum radiatum* and



*Bunostomum phlebotomum*. In six calves, each dosed with 20,000 larvae of *Oe. radiatum*, the prepatent period varied between 35 and 40 days, and the max.egg count from 740 to 1,552 per g. Egg production was very irregular, and the peak varied from 6 to 15 weeks. Larvae of the free-living stages of cattle strongyles and trichostrongyles developed in the faecal pat to the infective stage depending only on temperature, but could only migrate from the pat after it became saturated by rain. Larvae were viable in the pat for 5 months. Infectivity did not depend on age, provided they were active. Cu deficiency was not a major factor affecting nematode infestations in calves, but calves infested with *B. phlebotomum* did not absorb and store Cu as well as controls. "Neguvon" (Bayer L13/59) had high efficiency against the common nematodes of cattle. 2 g. per 100 lb. was highly effective against *H. placei* and *Oe. radiatum*, as was 5 g. per 100 lb. against *Cooperia* spp. (including *C. oncophora*) and *B. phlebotomum*, also against *O. ostertagi* and *T. axei*. Neither premedication with sodium bicarbonate nor starvation is necessary. The drug appears to be of very low toxicity. Dose rates up to 12.5 g./100 lb. have been used safely, although one calf dosed with 10 g./100 lb. died. Caution is still indicated. "Asuntol" (Bayer 21/199) at 0.25 g. per 100 lb. was highly effective against *H. placei* and *Cooperia* spp., and effective against *Oe. radiatum* and *T. axei* at higher dose rates. One calf dosed at 0.5 g. per 100 lb. died, and 0.25 g. per 100 lb. appears to be the maximum safe dose. "Dow ET-57" (at 5 g. per 100 lb.) was also highly effective against *H. placei* and *Cooperia* spp., and less efficient against *Oe. radiatum*. Some toxic effects but no deaths were observed.

PRE-CANCEROUS LESIONS of the eye of Hereford cattle are being studied. Strong relations exist between lesions and eyelid pigmentation.

In COBALT DEFICIENCY sheep cannot utilize fatty acids at a normal rate, and homogenates from their livers are unable to metabolize propionic acid, indicating the metabolic processes which fail in vitamin B<sub>12</sub> deficiency. Vitamin B<sub>12</sub> storage in the liver is a criterion of the status of the compound in the grazing sheep, while the amount in the blood reflects the Co status of the pastures. Co can be provided by administration of a heavy pellet. The physical properties of the pellet are important. A pellet can prevent vitamin B<sub>12</sub> deficiency for

about a year but some pellets will no longer protect against PHALARIS STAGGERS after 12 to 15 months. They may become coated with calcium phosphate and become ineffective; in young lambs this may occur within a week. COPPER DEFICIENCY can result from either a shortage of Cu in the fodder, or from faulty absorption and utilization due to excess of other elements in fodder which contains sufficient Cu. Sulphate in the fodder is one of the important factors. Within the rumen, sulphate is converted to hydrogen sulphide which reacts with ionized Cu to form the very refractory copper sulphide which is neither decomposed, nor absorbed at lower levels of the intestinal tract. The comparative biochemistry of copper is being studied in fowls and ducks. In PREGNANCY TOXAEMIA of ewes it is probable that severe adrenal hyperactivity in hypoglycaemic, undernourished ewes precipitates the syndrome. Sudden complete fasting alone is not sufficient to induce the disease. Hyperactivity of the adrenals under the stress of wet, cold, windy weather, is much greater than that induced by the hypoglycaemia of complete fasting. In pregnancy toxaemia there is a failure of liver fatty acid metabolism, amounting to liver failure. The liver of the sheep does not metabolize glucose owing to the absence of glucokinase—a difference from non-ruminants. Hydroxycortisone inhibits oxidation of various substances, including fatty acids, by complex formation between the steroid and coenzymes. Treatment with glycerol is effective in early cases in previously well nourished ewes, but not where there has been severe undernourishment for some weeks. Very young lambs deal with acetic acid twice as fast as adult sheep. The insulin-producing cells of the islet tissue in the pancreas of lambs can be clearly demonstrated by methods used for non-ruminants, but as the sheep mature the beta cells can be stained only with difficulty.

At 37°F. with a wind of 7 miles per hour and a rainfall of about  $\frac{1}{4}$  inch per hour newly shorn Merino sheep became severely hypothermic in 3 to 4 hours. HAEMOGLOBINURIA in sheep after phenobarbitone anaesthesia was due to propylene glycol in the anaesthetic solution.

POSTHITIS in wethers was related to pasture growth and composition; it increased during the autumn flush and decreased when pastures were dry. Some progress was made with a self-retaining sheath tube for treatment. URINARY CALCULI in wethers in the

west Darling region of N.S.W. were associated with grazing on lush herbaceous pastures.

In chronic COPPER POISONING the limitation on Cu storage imposed by Mo and inorganic S can be interfered with by Mn. Sheep continued to thrive when drinking water containing up to 0.9% sodium chloride plus 0.5% sodium sulphate, even on dry forage. Repeated ingestion of *Heliotropium europaeum* is a primary cause of death in sheep following liver damage by its alkaloids. Non-haemolytic jaundice is a common symptom. The liver damage induced in rats by the pyrrolizidine alkaloids from this plant is progressive and can be produced by a single sublethal dose. Other alkaloids with only a minor difference in ring structure have not produced liver damage. The plant also induces liver storage of copper at the high levels that may lead to haemolytic jaundice in sheep. The pure alkaloids of *Lupinus varius* did not cause liver damage. Secretion of saliva almost ceased 6 hours after sheep had gorged on wheat. Attempts to reproduce the syndrome of WHEAT ENGORGEMENT by increasing the water activity of the rumen contents to levels recorded in experimental cases in sheep by the use of polyethylene glycol failed. The experiments with polyethylene glycol are not considered to disprove the hypothesis that the condition is due to a combination of osmotic dehydration and alimentary lactacidosis.

Nutritional, metabolic and physiological studies on sheep included passage of digesta through the forestomachs; distribution of nitrogen in rumen contents; energy metabolism of vitamin B<sub>12</sub> deficient animals; urea supplementation (there was no advantage in adding it to silage during the ensiling process); factors affecting appetite (factors other than palatability are responsible); utilization of low-quality roughage; level of nutrition and breeding performance of Merino ewes; early weaning; effects of nutrition during mating and pre-mating; seasonal levels of fertility in Merinos; influence of light on breeding season; effect of nutrition during pregnancy; infertility on red clover pastures; lactation in ewes; physiology of neonatal lambs; husbandry practices and lamb mortality; feed intake of unweaned and weaned lambs on dry pastures; ewe-marking crayon for rams; electrolytic concentrations in erythrocytes; wool growth and the anterior pituitary; adrenal cortex and thyroid; wool growth in relation to feed intake; clover oestrogens.

Work on animal breeding and animal production included co-ordination of beef cattle investigations; hormones in beef production; prenatal development of skin and hair in cattle; drought feeding of cattle and sheep; adaptation of cattle to tropical environments (coat characters, sweat glands); crossbreeding projects with zebu types and with northern- and southern-bred Herefords; dentition studies on cattle, selection and productivity of sheep.—H. MCL. GORDON.

- I. Federation of Rhodesia and Nyasaland. (1959). **Report of the Secretary to the Federal Ministry of Agriculture for the year ended 30th September, 1958.** [Corry, J. R.] pp. 215. Salisbury: Government Printer. 10s. 6d. 1663
- II. Lawrence, D. A. (1959). **Report of the Director of Veterinary Services for the year ending 30th September, 1958.**—Rep. Secy Fed. Minist Agric. 1958, Rhodesia & Nyasaland pp. 161-165. 1664
- III. Christie, G. J. (1959). **Report of the Assistant Director of Veterinary Services (Research) for the year ending 30th September, 1958.**—Ibid. pp. 182-201. 1665
- IV. MacKinnon, J. (1959). **Report of the Assistant Director of Veterinary Services (Field) for the year ending 30th September, 1958.**—Ibid. pp. 166-181. 1666

I. Statistics indicate expansion of cattle population over the last five years. Imports were restricted to 12,000 head compared with 14,000 last year and 40,000 the year before.

Dairy production continued to increase and is becoming of increased importance in agricultural production.

Poultry and eggs have been in fair supply. The production of table poultry has increased spectacularly to the extent of double the number and treble the value in two years.

Pig production has for some years varied between a marked decline to a slight increase. For the first time facilities for progeny testing have been made available. A full report of all pigs tested has been published.

Sheep production has increased and a Sheep Breeders' Association has been formed to promote interest.

The long-term study of the influence of nutrition on fertility of beef cattle has continued satisfactorily throughout the year. The animals were bred for the second time during the February, March and April breeding season. The study is to be continued



throughout the productive life of the animals and the long-term effects can only be accurately assessed at the completion of the trial.

The task of re-organizing the Department for tsetse fly control by techniques other than game destruction has been hampered by the general deterioration this year of the trypanosomiasis situation in the east and south-east of Southern Rhodesia.

II. The Department operates two branches, field and research. The appointment of laboratory and meat inspection assistants presents a real problem, probably owing to low salary scales. With the increase of TRYPANOSOMIASIS and the desire for an Artificial Insemination centre, the establishment will require expansion.

The contact of game and cattle in some districts, as has occurred for the past 17 years, is always a means of spreading FOOT AND MOUTH DISEASE. TRYPANOSOMIASIS, although less spectacular than many other diseases, can now be regarded as one of the most important diseases met with.

The slight reduction in RABIES during the year is significant. Control measures are largely based on vaccination, although breaks of immunity in vaccinated dogs have caused misgivings for some years.

Appreciable progress is being made against TUBERCULOSIS and the voluntary eradication scheme with compensation for reactors under certain conditions, is going steadily.

Two diseases affecting breeding are scheduled, CONTAGIOUS ABORTION and "Epi-vag" (contagious epididymitis in bulls and contagious vaginitis in cows).

An additional officer has been appointed to the research staff and has been engaged in parasitological investigation.

III. The diagnostic service in addition to routine diagnosis for the Field Department examined specimens for practitioners and farmers. The work has greatly increased in recent years and such tests as enterotoxaemia neutralizations, virus antibody neutralizations, toxicity tests for plants and chemicals, antibody sensitivity tests etc. are required more frequently.

During the year 3,412 agglutination tests for CONTAGIOUS ABORTION revealed 403 positive results involving 49 infected premises.

More work is required on such diseases as HISTOMONIASIS, which in Rhodesia appears

to be largely confined to fowls, especially young birds.

The artificial insemination centre is supervised by the Research Department. Regarding contagious bovine INFERTILITY further observation supports the impression that the syndrome EPIDIDYMITIS AND VAGINITIS does not appear to be specific and possibly includes such diseases as VIBRIOSIS and CORYNEBACTERIUM INFECTION.

BRUCELLOSIS used to be diagnosed by blood agglutination tests, the milk ring test and by the isolation of the infective organism from the aborted foetus; but to bring the laboratory into line with the other African laboratories, the international unit system is the method now adopted in the standardization of the serum agglutination test. This bases the test on the Weybridge method which is rapidly becoming the International method.

The use of the new drug "spirotrypan" for the treatment of ANAPLASMOSIS did not appear to have any beneficial effect on the course of artificially produced disease.

Investigations were commenced on the newer trypanocidal drugs with particular reference to their toxicity, local reactions and prophylactic properties.

Research on the fertility of ranch cattle of the Afrikaner breed, showed that out of 100 cows, when put to the bull at three years of age a fertility of 96% was achieved but at the second calving the fertility was only 38% and 69.3% for the third calving.

IV. Meat inspection was only carried out by the Department at the Cold Storage Commission abattoirs, but elsewhere in the country it is the responsibility of the Department of Health.

A mild winter favoured the survival of all species of tick.

FOOT AND MOUTH DISEASE was fairly prevalent and large numbers of cattle were inoculated. All outbreaks originated in country populated with game. It is interesting to learn that in the Nuanetsi native district the first outbreak was caused by SAT 2, whereas the second (three months later) was due to SAT 1. The same phenomenon occurred in the Wankie native district in the March and August outbreaks, being due to SAT 2 and SAT 1 respectively.

Forty-one positive cases of RABIES were confirmed, 33 in dogs, 6 in jackals and 2 in man. This makes 865 cases since 1950. Three of this year's cases occurred in vaccinated dogs. ANTHRAX was confirmed in 313 cases

and 180,293 cattle were inoculated with anthrax vaccine.

The number of herds under test for TUBERCULOSIS increased by 63 and of cattle, by 6,347 head. The disease was seen in abattoirs in 931 cattle and 177 pigs.

TRYPANOSOMIASIS continued to be of considerable economic importance; 28,333 smears were examined of which 578 were positive and 69,505 inoculations were carried out.

Many non-scheduled diseases were met with including cases of poisoning, many due to careless handling of arsenical dips.

It was found possible to start an A.I. centre so that there are now three in operation.

—D. S. RABAGLIATI.

Uganda. (1959). **Annual report of the Department of Veterinary Services and Animal Industry for the year ended 31st December, 1958.**

[Randall, J. B.] pp. 52. Entebbe, Uganda: Govt. Printer. Shs. 3/60. 1667

Cattle in Uganda totalled 3,430,000, sheep and goats 3,857,000. The over-all slaughter for meat rose to 410,000 head.

Stock-owners paid nearly £36,000 for drugs and vaccines as curatives but were reluctant to pay for such vaccines as ANTHRAX, BLACKLEG, HAEMORRHAGIC SEPTICAEMIA unless a threat of disease was immediate. The Protectorate Government controlled free of charge RINDERPEST, BOVINE CONTAGIOUS PLEUROPNEUMONIA, RABIES in Proclaimed Rabies Districts and in certain circumstances ANTHRAX as a public health measure.

FOOT AND MOUTH DISEASE occurred in all districts, the virus types "O", "A" and SAT 2 being confirmed. Outbreaks of ANTHRAX and HAEMORRHAGIC SEPTICAEMIA were controlled by vaccination.

TRYPANOSOMIASIS control involved the treatment of 255,700 cattle with anttrypanicide dimethyl sulphate and in addition 16,000 cattle were maintained in areas of light tsetse fly density under the protection of anttrypanicide prosect.

RINDERPEST has for years been endemic in cattle and game in north-eastern Uganda and also in the southern Sudan. The disease was diagnosed in goats and was confirmed by laboratory tests at the E. A. Research Organisation at Muguga and by the Animal Health Research centre at Entebbe; this is the first record of rinderpest in goats in East Africa.

ANTHRAX was recorded in the majority of districts except in the northern Province.

BLACKLEG was widespread and HAEMORRHAGIC SEPTICAEMIA in cattle due to *Pasteurella septica* was reported from Buganda in the Western Province. TUBERCULOSIS is prevalent in Ankole cattle, but the nomadic habits of their owners make any campaign to get rid of it impracticable. RABIES remains enzootic in the West Nile districts, the positive cases being in dogs.

BRUCELLOSIS assumes greater relative importance as livestock standards develop.

Two refresher courses were held during the year at the Veterinary Training Institute.

The work of the Research Services developed well during 1958 although none of the five sections of the laboratory was fully staffed throughout the year.

The report contains 15 statistical tables, ten appendices and a map showing the distribution of the cattle population.

—D. S. RABAGLIATI.

British Guiana. (1959). **Annual report of the Director of Agriculture for the year 1958.** pp. 55. [Items of veterinary interest pp. 25-31.] 1668

The Assistant Director (Veterinary) is in charge of the Veterinary Service, which comprises five veterinary officers and technical assistants. The main measures adopted are prophylactic inoculation, isolation, restriction of movement and the slaughter policy on occasions. The animal breeding is also carried out by the Veterinary Division and the Artificial Insemination Service centred on the Central Agricultural Station operates over the coastal belt.

The main outbreaks of disease were paralytic RABIES and EQUINE ENCEPHALOMYELITIS. For poultry preventive inoculation against FOWL POX and NEWCASTLE DISEASE was continued.

Other bacterial and virus diseases were ABORTION in cattle, caused by *Vibrio fetus*; TRICHOMONIASIS, MASTITIS and FOWL POX. Of protozoal diseases, PIROPLASMOSIS and ANAPLASMOSIS were present along with TRYPANOSOMIASIS which occurred spasmodically in horses and cattle.

No comprehensive programme of research could be formulated with the staff available but there were limited studies on the fertility of hatching eggs, tranquillizing drugs, and investigation of the poisoning of water supplies by the use of white hiar (Lonchocarpus spp.). The Research officer was in charge of the Ebini Livestock Station the



primary object of which was to find out how cattle can be grown on mineral-deficient savannahs by feeding mineral supplements, fertilizing, planting of improved grasses and proper management.—D. S. RABAGLIATI.

Thijn, J. W. (1960). Netherlands. 13e jaarverslag van de "Stichting Provinciale Gezondheidsdienst voor Dieren in Drenthe". 1 Mei 1958—30 April 1959. [13th Annual Report, Health Service for Animals in Drenthe Province.] pp. 98. Assen: Van Gorcum. 1669

Herds in this TUBERCULOSIS-free area are now tuberculin tested every second year. Thus in the year 1958/59 half the cattle population (total 210,000 animals) were tested and 77 (0.04%) gave positive reactions and were slaughtered, a slightly higher figure than during the previous year [V.B. 29, 2307]. Many cases were associated with the presence on the same farm of tuberculous human beings. TB. lesions were found in 25 of the reactors.

Great progress was made in the control of bovine BRUCELLOSIS and it was hoped that all 16,000 herds in the province would be free from infection by May 1960. Since calves in brucella-free herds are no longer inoculated with Strain 19 vaccine, the number of inoculations fell from 25,000 in the previous year to 3,800. If a reactor is found in a herd already declared free from brucellosis on the basis of 3 consecutive negative ring tests on milk, all other cattle are blood-tested, and the State gives a premium of 250 florins for every

reactor slaughtered. Control regulations are reproduced at the end of the report.

There is also mention of artificial insemination in cattle and pigs, warble-fly control and foot and mouth disease (204,000 cattle were immunized).—R.M.

U.S.A. California. (1958-1959). Annual report of the Los Angeles County Livestock Department for the years 1958-1959. [Schroeder, R. J.] pp. 23. California: County of Los Angeles. 1670

The Department is responsible for diagnosis, control and eradication of infectious diseases, controls importation of livestock, acts as the veterinary public health unit of the county, and in co-operation with the public health officer aids in the diagnosis and control of animal diseases transmissible to man.

All imported dairy cattle are inspected and tested for TUBERCULOSIS. During the year 53,396 cattle were tested and 90 reactors found. The accelerated BRUCELLOSIS control programme is proceeding rapidly. FOOT AND MOUTH DISEASE and VESICULAR STOMATITIS have not occurred for many years. SHEEP SCAB and SCRAPIE control are still being carried out.

During the year 1,396 disease investigations were carried out; those diseases considered to be of particular importance included EQUINE ENCEPHALOMYELITIS, BLUETONGUE, LEPTOSPIROSIS, INFECTIOUS RHINOTRACHEITIS and VIBRIOSIS in dairy cattle.

SWINE FEVER remains one of the most serious diseases of pigs.—D. S. RABAGLIATI.

## BOOK REVIEWS

McGrath, J. T. (1960). Neurologic examination of the dog with clinico-pathologic observations. pp. 281. Philadelphia: Lea & Febiger (London: Henry Kimpton) 2nd Edit. \$7.00. (52s. 6d.) 1671

The author is a veterinary pathologist who took up the study of comparative neurology and neuropathology and had the benefit of close collaboration with his university medical colleagues in these fields. Within 281 pages he has compiled a highly commendable book on neurological diseases of dogs, from both clinical and pathological viewpoints. The goal of the author is enunciated in the preface. The thesis is a modest one, viz., that veterinarians are capable of making adequate neurological examination of dogs, with a little effort. This might seem trite, but it is not often given

credence in veterinary (or medical) circles. He starts by presenting some practical aspects of neuroanatomy and neurophysiology to convince veterinary clinicians that diagnostic methods of clinical neurology can be used with success. Apart from objective findings, he proves that X-ray examination can be a valuable aid, thus bridging the gap between radiology—where veterinarians are now at home—and neurology where most of them have feared to tread. He indicates that in future angiography and electronencephalography might well find a place in canine diagnostic work—possibly technique and expense being major obstacles, but X-ray and c.s.f. examinations were difficult and expensive when first used on animals.

Dr. McGrath set himself no mean task in

writing a book on the dog which would introduce the subjects of neurology and neuropathology, which must be correlated one with the other, ostensibly for veterinarians (clinicians but also pathologists) in the first place. His experiences as a clinician, pathologist and neuropathologist show in the trends of the book. In the present day of specialization in human medicine such an approach is well-nigh impossible, but in veterinary medicine, it can still be done, and perhaps may be the best way to study animal diseases—see the animal patients alive when sick, and dissect them when they are dead. Dr. McGrath has uncovered a goodly number of clinico-pathological entities of the nervous system in dogs, hitherto not generally recognized. In fact the incidence, and therefore importance, of neurological diseases in dogs in McGrath's material are higher than anywhere else. This is just another way of saying that the veterinary pathologist is more apt to identify disease processes of the nervous system if he is backed up by previous good clinical data. While in the case of the lower animals, this is perforce restricted to objective tests, McGrath has shown what can be done and in a practical definitive manner. Finally, he shows how understanding of pathology is essential for clarification of clinical conditions, *i.e.*, it can illustrate disordered physiology, and such an understanding at least need not be the unchallenged possession of pathologists.

The text is offered mainly to veterinary practitioners but its value goes much further. It is indispensable for veterinary pathologists and is of value to workers in experimental medicine who use dogs as experimental animals. It shows the legion of spontaneous neurological conditions which occur in the canine species, and which might confuse results when dogs are used by pharmacologists, toxicologists and pathologists for chronic toxicity experiments.

The Introduction deals with the clinical problem which is to answer the questions "where is, and what is, the lesion".

The mechanisms of normal function are described. Then the reflexes which can be tested in dogs to pin-point dysfunction are defined. Attention is given to the value of examination of the cerebrospinal fluid, which can be tapped and examined just as easily as in man. Thereafter, categories of neurological diseases are dealt with, and illustrated by pictures of affected animals and of pathology. A few of the listed conditions include con-

genital abnormalities, hydrocephalus, cerebellar disorders, epilepsy, trauma, metabolic and toxic disorders, infectious diseases due to bacteria, viruses, protozoa and fungi, and disk troubles. Medical pathologists will be surprised that Dr. McGrath has studied with some clinico-pathological precision 88 primary tumours of the canine nervous system and 48 cases with metastatic neural involvement. This upsets the common belief that the incidence of gliomata, meningeal, and hypophyseal tumours of the nervous system in domesticated animals is low as compared with man.

The bibliography has been improved in scope from the first edition and new illustrations have enhanced the sum total of photographs. The author is to be congratulated on his enthusiastic endeavour and for having made available a short, concise, readable and lucid text. No worker interested in diseases of the nervous system of the dog, whether he be a veterinary clinician or pathologist, an experimentalist using dogs for any purpose, or an experimental neuropathologist, should be without it. With the present high cost of books, the price is cheap.—J. R. M. INNES.

Fritzsch, K., Gerriets, E. (1959). Geflügelkrankheiten. Lehrbuch für Tierärzte und Studierende der Veterinärmedizin. [**Diseases of poultry.**] pp. xi. + 387. Berlin (& Hamburg): Paul Parey. DM. 49. 1672

This textbook for veterinary students and practitioners contains sections on general hygiene and on rearing, housing and slaughter, virus, bacterial, arthropod, helminth and protozoal diseases and fungal infections, poisoning, hereditary diseases, nutrition, metabolic disorders, vitamin deficiencies, cannibalism and other forms of perverted appetite, technical instructions on surgical treatment and therapy including chapters on restraint, technique of injection, treatment of fractures, anaesthesia, caponizing, sexing and artificial insemination. A very useful feature is the bibliography, containing references up to 1958, classified under headings similar to those of the sections. There are over 200 very good illustrations, some of which are in colour. The book is very well produced and well indexed.—E.G.

Roy, J. H. B. (1959). **The calf. Its management, feeding and health.** pp. xii + 126. London: Farmer & Stock-Breeder Publications Ltd. 2nd Edit. 9s. 6d. 1673

This booklet is one of a series of popular, practical farming manuals. It consists of two parts, one dealing with management and feed-



ing, the other with mortality and diseases. Among the diseases listed are brucellosis, tuberculosis, Johne's disease, mastitis, calf scours, navel ill, calf diphtheria (*Fusiformis necrophorus* infection), salmonellosis, pneumonia, blackleg, bloat, rickets, hypomagnesaemia, lead poisoning, coccidiosis, parasitic gastro-enteritis, lungworm infestation, ringworm and warbles. There are 17 tables, numerous diagrams, line drawings and photographs and a bibliography comprising 195 references.—E.G.

Keast, A., Crocker, R. L., Christian, C. S. [Edited by.] (1959). **Biogeography and ecology in Australia**. pp. 640. The Hague: Dr. W. Junk. Dutch guilders 65. [Monographiae Biologicae Vol. VIII.] 1674

Ecology had been defined as "scientific natural history". As this book represents an account of the natural history of a continent which from the biologist's point of view is a particularly interesting part of the earth, its 37 chapters cover a very wide field. The concern is primarily zoological although there are chapters dealing with vegetation and climate, and some that are of very direct interest to veterinary science, for instance, those dealing with the ecology of sheep and of the herbage plants on which they graze in arid parts, "the sheep maggot fly", ornithosis and myxomatosis.

In addition to its specialized scientific value, however, it has an interest for the enquiring reader who may seek an explanation of some of the mysteries of the evolutionary

development of living things. Undoubtedly there is a satisfaction to be derived from what the ecologists have to tell, and although some of their explanations may be far from the truth the appreciation of their arguments does, at least, fill a void and enable one to think one understands. To read through this book is to take a very informative voyage through time as well as through a strange land, filled with living things very different from those with which we are familiar. One contributor in entomology points out that all vertebrate animals are but creatures of yesterday and that many groups of insects completed their major evolutionary development well before the dawn of vertebrates. To read of the detailed evidence for this and for the time during which Australia has been separated from the rest of the earth produces a lasting impression, and a feeling, almost of apprehension, that the advent of civilized man, the greatest of all ecological catastrophes, should upset the ultimate outcome.

In view of the vastness of the field it is no wonder that the resources of university departments were found inadequate to undertake the task of conservation and agricultural production for which purpose funds were ultimately allocated to the C.S.I.R.O., under the chairmanship of the late Sir Ian Clunies Ross. Thirty million pounds were spent over the years, but one hundred million pounds a year gained—which should be argument enough for Treasury Departments to finance fundamental work of this kind.

—E. L. TAYLOR.

#### BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review]

Alexander, F. (1960). **An introduction to veterinary pharmacology**. pp. viii + 179. Edinburgh (& London): E. & S. Livingstone Ltd. 20s.

Lewis, J. J. (1960). **An introduction to pharmacology**. pp. xii + 826. Edinburgh (& Lon-

don): E. & S. Livingstone Ltd. 55s.

Thornton, H. (1960). **The inspection of food. A handbook for students of public health, agriculture and meat technology**. pp. 213. London: Baillière, Tindall & Cox. 2nd Edit. 15s.

The Editor will be glad to receive publications relating to Veterinary Science and cognate subjects in order that they may be dealt with in the *Veterinary Bulletin*.

Reports of Departments, Special Reports, reprints, etc., etc., should be sent as soon as they are issued.

#### Books for Review.

The Editor will be glad to receive books for review in the *Veterinary Bulletin*.

Bulletins on disease subjects written for farmers and "popular" articles of a similar nature are not included in the *Veterinary Bulletin*. Those of a sufficiently important nature are, however, included in *Index Veterinarius*; so also are certain review articles, presidential addresses, congress proceedings, etc., where the title conveys as much information as could be given in an abstract of a few lines. For information of this nature, readers of the *Veterinary Bulletin* are referred to *Index Veterinarius*, where titles of all publications indexed by the bureau are fully cross-referenced.





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The abbreviations used in *Index Veterinarius* and *The Veterinary Bulletin* are those of the *World List of Scientific Periodicals published in the years 1900-1950*, 3rd Edit. (1952), London: Butterworths Scientific Publications.



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